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Medical, therapeutic, and recreational use of cannabis among young men who have sex with men living with HIV

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Abstract

Cannabis plays a role in symptoms management in HIV, especially the alleviation of pain and nausea and stimulation of appetite, and prevalence of cannabis use in HIV-positive populations exceeds that of the general U.S. population. Previous research has described an “overlap” between medical and recreational cannabis use among persons living with HIV. To understand better the motives associated cannabis use among young men who have sex with men living with HIV (HIV + YMSM), we conducted semi-structured interviews with 30 HIV+YMSM in Denver and Chicago. Interviews were audio-recorded, transcribed, and coded by a diverse team of analysts. In addition to findings that mapped onto previously identified medical motives and recreational motives, we identified several themes that straddled medical and recreational use in a domain we describe as therapeutic. Themes identified in this therapeutic domain of cannabis use include (a) enhanced introspection among individuals that promotes psychological adjustment to an HIV diagnosis, improved medical management, and future orientation; (b) reflection processes that mitigate interpersonal conflict and improve interpersonal communication; and (c) a social-therapeutic phenomena of cannabis use among young persons with living HIV that is characterized by both enhanced introspection and improved interpersonal communication. Our findings suggest a spectrum of cannabis use among HIV+ YMSM that may be characterized not only by an overlap between medical and recreational use, but also by a distinct therapeutic domain that incorporates stress alleviation and cognitive expansion processes to improve focus on HIV management and self-care.

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Declaration of Interest Statement

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Introduction

Public views on the use of cannabis (cannabis) are undergoing a profound shift that coincides with emerging evidence of its use in the treatment of selected health conditions (NAESM, 2017; Whiting, et al., 2015), including HIV (Abrams, et al., 2007). Medical cannabis is legal in 21 countries worldwide, and 33 states in the U.S. Additionally, decriminalization and legalization of recreational use of cannabis in selected jurisdictions continues apace, both across the U.S. and internationally. Within this changing public sphere and clinical environment, it is important to understand the multiple influences on cannabis use among young men who have sex with men living with HIV (HIV+YMSM), who as a group reports daily use rates at 4–5 times the rate of population-based samples of emerging adults in the U.S. (Bruce, et al., 2013; Bruce, et al., 2015; Schulenberg, et al., 2017).

Panel data has shown that cannabis use in the U.S. spikes during late adolescence and emerging adulthood, with daily use among persons aged 18–24 estimated at 6–8% (Schulenberg et al. 2017). Cannabis use appears to be even more prevalent among HIV +YMSM, with studies reporting daily use ranging from 25% to 33% (Bruce et al. 2013; Bruce et al. 2015). Cannabis dependency can have a number of negative health and social consequences among young adults, including cognitive impairment, altered brain development, respiratory problems, and financial and employment problems, with more pronounced effects for those who start using cannabis in early adolescence (Brook et al. 2008; Silins et al. 2014; Volkow et al. 2014).

Consistent findings demonstrate that cannabis plays a role in symptoms management in HIV, especially the alleviation of pain and nausea and stimulation of appetite in adults living with HIV (Abrams et al. 2007; Braitstein et al. 2001; Corless et al. 2009; Ellis et al. 2009; Harris et al. 2014; Ware et al. 2003), and prevalence of medical cannabis use is higher in HIV-positive populations than in the general U.S. population (Pacek et al. 2018; Lin et al. 2016). Stress management and alleviation of anxiety among persons living with HIV (PLWH) also has been shown to be facilitated through use of cannabis (Harris, et al., 2014; Prentiss et al. 2004; Ware et al. 2003), although there may be significant overlap between “recreational” use and “medical” or “medicinal” use when considering cannabis use, stress and HIV (D’Souza et al. 2012; Furler et al. 2004; Harris, et al., 2014; Prentiss, et al., 2004;). The self-reported beneficial effects of cannabis in the alleviation of anxiety and stress via its mood-altering properties, in addition to its potential for alleviation of medical symptoms such as pain and nausea, may confound the easy classification of such use into “medical/medicinal” or “recreational” categories. Further, the use of cannabis that is not medically prescribed for HIV-related symptom relief, and the use of medical cannabis for its mood-enhancing potential may further cloud this distinction in PLWH (D’Souza et al. 2012; Harris et al. 2014).

Previous research on cannabis use and HIV care continuum outcomes is relatively sparse and has produced mixed results with findings that often vary by the population being studied. Cannabis use has been associated positively with adherence among nausea sufferers, but negatively associated with adherence among those not reporting nausea (DeJong et al. 2005). In a multi-site, multi-country randomized controlled trial, there were no differences

in self-reported medication adherence between non-cannabis and cannabis users (Corless et al. 2009). A study of adults living with HIV in Florida reported no association between cannabis use and viral suppression (Okafor et al. 2017). Bonn-Miller et al. (2014) reported that cannabis-dependent users in California exhibit significantly worse adherence than non-dependent users. In contrast, recent studies from Canada have shown that, among persons who use illicit drugs, there is no association between daily cannabis use and adherence, being on ART, or viral suppression (Lake et al. 2017; Slawson et al. 2015). Although, daily use has been associated with greater likelihood for missed appointments among adult PLWH (Kipp et al. 2017), it has also been associated with higher CD4 counts and quality of life in women living with HIV (D'Souza et al. 2012). Fogarty et al. (2007) found that adults in Australia who reported using cannabis for medical reasons had a higher CD4 count than did their peers who reported using cannabis for recreational purposes, suggesting that motivations for use may be an important factor in clinical outcomes for adults living with HIV. Indeed, a review by Gonzalez, et al. summarized cannabis's effect on adherence as "a potential barrier or facilitator of adherence, depending perhaps, on motivation for use" (Gonzalez et al. 2011, p, 227).

Cannabis use is associated with a range of self-reported effects reported in the literature, with the most frequently reported being relaxation, concentration, time slowing down, improved sleep, and improved thinking (Green et al. 2003). Among adolescents, expectancies associated positively with cannabis use include cognitive-motor enhancement and relaxation, whereas negative expectancies associated with non-use include cognitive-behavioral impairment (Kristjansson et al. 2012). Previous research on motives for cannabis use among young persons has conceptualized cannabis use within a recreational taxonomy, including domains relating to cognitive expansion, socialization, enhancement of activities, and coping (Simons et al. 1996; Zvolensky et al. 2007). Discourse analysis among cannabis users has identified creativity and alternative ways of thinking as reasons for use (Sandberg, 2012). Ethnographic research has divided recreational cannabis adult users into two groups: those that use to enhance relaxation and those that use also to enhance concentration (Osborne & Fogel 2008). Recent findings have reported adults living with HIV using cannabis for mental health and socialization and expansion motives in tandem with medical use and symptom management (Towe et al. 2018). The degree to which recreational motives, such as enhancement, expansion, or socialization, may align or map onto medically-oriented motives for cannabis use among HIV+ YMSM has not been previously reported.

From a stress-and-coping addiction perspective, substance use may serve as a coping mechanism to reduce negative affect and increase positive affect (Shiffman & Wills 1985). Elevated levels of stress and maladaptive coping are positively associated with cannabis dependence and with higher rates of cannabis-related problems (Bujarski et al. 2012; Farris et al. 2016; Hyman & Sinha 2009; Manning et al. 2018). Among HIV+YMSM, elevated cannabis use has been linked with the alleviation of HIV-related stress and side effects, active and avoidant coping techniques, as well as delayed linkage to care (Bruce et al., 2013). Much of the substance use and addiction literature posits that recreational cannabis use may be a coping response to stress, with minority stressors such as internalized homophobia and experiencing anti-gay discrimination playing a particularly strong role in use among YMSM (Bruce et al. 2014; Feinstein & Newcomb 2016); however, the reflective

processes and improved concentration noted in previous research suggests that cannabis may also help support appraisal processes in assessing stressors (Green et al. 2003; Osborne & Fogel 2008). How such processes may encompass therapeutic dimensions beyond adaptive coping has not been well described.

Given the relatively high prevalence of heavy cannabis use among HIV+YMSM, it is important to better understand the reasons for use and to disentangle the potential overlap between what is considered recreational and medicinal use in this population (Furler et al. 2004; Harris et al. 2014). In other words, is use that relieves stress associated with HIV disease recreational, medical, or does it fall into a separate category? Qualitative research may serve as a means for assessing in more depth the overlap between medical and recreational use (Furle, et al. 2004). We conducted an exploratory qualitative study with 30 HIV+ YMSM In order to better understand domains of cannabis use that may characterize the “overlap” between medical and recreational use in this population.

Methods

Study Design

The data from this study derive from the first phase of a mixed-methods study examining the relationship between cannabis use and HIV continuum outcomes YMSM in Chicago, IL and Denver, CO, two jurisdictions with different legal cannabis contexts. For this phase of the study, we conducted in-depth interviews with 30 HIV+ YMSM in Chicago (n=15) and Denver (n=15) who reported using cannabis. We developed a semi-structured interview script to assess motivations for cannabis use in this population using an ecologic framework, consisting of open-ended questions assessing intrapersonal, interpersonal, community and macro-level factors (Bronfenbrenner, 1979). Lines of questioning in the interview script were designed to proceed from general (“People use alcohol and/or drugs for a lot of different reasons. Tell me about your relationship with marijuana”) to more specific questions (“How has your use of marijuana changed since you tested positive?”). The semi-structured format provided interviewers with a guide through which to investigate the domains of interest while allowing for participants to determine the context of the interview’s questions through their own narratives.

Study Procedures

We recruited participants through flyers distributed at adolescent HIV clinics and service sites, and peer referral in both cities. Eligibility criteria included the following: (a) defined male at birth and identifying as male at time of study participation; (b) HIV-infected as documented by medical record review by site coordinator; (c) between the age of 18–24 years; (d) HIV infection occurred through sexual or substance use behavior of the participant; (e) ability to understand both written and spoken English; (f) history of at least one sexual encounter involving either anal or oral penetration (either receptive or insertive) with a male partner during the 12 months prior to enrollment; and (g) history of cannabis use during the 3 months prior to enrollment.

Persons interested in participating in the study were screened by study coordinators at each study site to determine eligibility. Eligible participants then scheduled a data collection appointment where informed verbal consent was obtained and the interview was conducted. All interviews took place in private rooms and were conducted by trained qualitative interviewers from the research team who were experienced in conducting in-depth interviews with HIV+ YMSM. Interviews ranged in length from 38 to 79 (M=51) minutes. At the conclusion of the interview, participants were compensated \$40 in cash for their time and effort. All interviews were digitally recorded, then transcribed by a professional transcription service. Once each transcript was cross-validated with its digital recording, the digital recording was destroyed. The research protocol was approved by the Institutional Review Boards at DePaul University, the University of Chicago and Children's Hospital of Colorado/University of Colorado at Denver.

Data Analysis

The lead author conducted a content analysis of the validated transcripts using open coding to develop a coding framework for medical, therapeutic, and recreational uses of cannabis, with themes and sub-themes appended to excerpts from the transcripts (Strauss & Corbin 1990; Miles & Huberman 1994). Axial coding was then performed to group themes into larger meaningful categories. A diverse team of five data analysts then reviewed the coding framework and refined categories, sub-categories and code definitions to create an initial codebook. Transcripts were uploaded to Dedoose® to organize and code data, as well as to create coding memos and notes for discussion at subsequent team meetings. The analytic team blind coded a single interview in Dedoose using the initial codebook. Results of the individual codings were discussed and coding differences resolved until consensus was achieved on a revised codebook. The analytic team then blind coded a second interview using the revised codebook, and the subsequent analyses resulted in convergent coding. The balance of the transcripts were then coded by the analytic team (Stewart & Shamdasani 1990).

RESULTS

Participants

Participants were African American/Black (n=16), Latino/Hispanic (n=6), White (n=5), and multiracial (n=3) YMSM living with HIV who identified as gay (n=20), bisexual (n=6), queer (n=2), and same-gender-loving (n=2). Ages of participants ranged from 21 to 24 years (M=23.1 years, SD = 1.1). Participant age and sexual orientation did not differ by city, but the Chicago sub-sample had higher proportions of African American participants (80% compared to 26.7%), and the Denver sub-sample had higher proportions of Latino/Hispanic (40% to 0%) and white (20% to 6.25%) participants. In general, Denver participants reported using a wider range of cannabis products and utilization methods, including edibles, vaporization, and CBD (cannabidiol) products, in addition to smoked flower.

Summary of Findings

Participants reported a range of medical and recreational use of cannabis that we briefly summarize below, and which largely aligned with extant research on cannabis use. In

addition, participants described use that incorporated elements of recreational use (relaxation, stress alleviation) with medical use (attention to HIV management and self-care issues) in a domain that we classify as *therapeutic*, and we propose that this therapeutic use exists on a spectrum between medical and recreational use. The brevity of the summaries of medical and recreational use below is intentional in order to (1) provide reference points on the spectrum of use with which to view the distinctiveness of the therapeutic domain, and (2) allocate more space for exploration of the therapeutic domain in this paper.

Medical Use—We defined medical use as any use of cannabis for medicinal purposes related to HIV disease or other medical reasons. Descriptions of medical use aligned largely with existing findings on cannabis use among persons living with HIV, including use to improve appetite (“I just started smoking just to get my appetite up because the pill I was taking has a 500-calorie requirement”), to address HIV medication side effects (“It helps the nausea, it helps the headache”), and to manage pain. One young man gave an example of how cannabis helped improve his appetite by managing stomach pain associated with medications:

I started smoking more because the stomach pains in the morning like right after I take my medicine, I get stomach pains. Or I feel like all day like if I eat something, that’s when my stomach will start hurting. Marijuana basically gives me an appetite without the pain.

--“Carl,” 21 year old Black gay man, Chicago

Non-HIV medical use also was described by participants living with glaucoma and post-traumatic stress disorder. Perhaps not surprisingly, given that medical cannabis has been legal in Colorado since 2000, Denver participants demonstrated more knowledge regarding differentiation of cannabis products for medical purposes (“A lot of my friends have muscle aches, and I’ll be like, ‘Hey, take a hit of the CBD vape, and then it goes away’.”). A summary of excerpts coded as medical use across cases revealed that 19 participants (63% of sample) reported some form of medical use.

Recreational Use—We defined recreational use as any use of cannabis for recreational purposes with no explicit link to HIV-related concerns or other therapeutic domain. Recreational use reported by participants converged with previous research on cannabis use among young adults, as most participants described relaxation and socialization motives for use. The following young man explained how he perceived cannabis use helped making new social situations more relaxed:

It [marijuana] kind of helps with being social a little bit...For example, I went to a Halloween party, and there were drinks and marijuana there. And when we got into the smoke, a certain amount of people came up and we started conversing. And it was kind of like – it broke the ice, and we communicated, and we got to know each other a little better instead of just sitting there with our drinks in our hands. –

“Mike,” 22 year old gay Black man, Denver

Social contexts of use ranged from enhancement of social activities (“Just a couple of hits, or maybe a dab, depending on who I’m hanging out with, and then movie or light shows,

“and “Everyone gets more talkative, and that’s entertaining”) to broader network-wide phenomena (“Everybody around me smokes it. Weed makes the world go round. It brings people together” and “It’s the intoxicant that people generally enjoy”). In rare cases, a few participants maintained that their cannabis use was exclusively private and more anti-social than pro-social (“I can think when I smoke. I can’t speak. So, I would not want to be with six people smoking a joint in a public space... I’m not going to be very comfortable.”). A total of 27 participants (90% of sample) reported at least one example of recreational use.

Therapeutic Use—Participants described motivations for cannabis use that contained elements of medical and recreational uses, but consisted of distinct domains that conferred therapeutic benefit in the management of living with a stigmatized chronic conditions such as HIV/AIDS. Therapeutic use was distinguished from what is traditionally thought of as medical or recreational use by introspective processes that aided in the participants’ focus on adjusting to, managing, and conceiving of a future living with HIV/AIDS. Additionally, participants reported improved interpersonal communication through the use of cannabis. Finally, a social-therapeutic process in which the introspection that characterized participant adjustment, management, and future orientation of living with HIV/AIDS was facilitated and transmitted through shared use of cannabis in social settings. In each of these processes -- introspective, interpersonal, and social-therapeutic -- the settings for these processes consisted of participants creating a cognitive space through the use of cannabis in which they appraised, reflected on, focused on, strategized, and communicated responses to and decisions regarding their lives as young men living with HIV. Eighteen participants (60% of sample) reported at least one form of therapeutic use. In order to provide context to the range of therapeutic use, we include longer direct quotes from participants (with aliases and selected demographics) that are illustrative of identified themes and sub-themes of therapeutic use in Table 1. A conceptual model of processes associated with therapeutic use appears as Figure 1.

Introspection

In general, participants described introspective processes as phenomena associated with getting high. Some smoked intentionally to appraise and reflect on specific issues they were facing at the time, while others spoke of how cannabis helped to focus on particular areas of their life. Across interviews, participants described cannabis as providing a cognitive space in which their thoughts slowed down and enabled them to not only focus but also redirect their thinking, such as the example provided by “James” in Table 1. Introspective processes associated with adjustment to diagnosis typically involved appraisal of HIV-related stress, while processes linked to medical management and future orientation were characterized by increased focus conferred through cannabis use. We provide exploration of these introspection sub-themes below.

Adjustment to Diagnosis.—Several participants described the use of cannabis as an aid in adjustment to the HIV diagnosis through introspective processes. For many of these young men, the period post-diagnosis was characterized by experiences of isolation, internalization of stigma, stress regarding disclosure of one’s status to others, and feelings of hopelessness (“Marijuana helped me with that because I thought like it was a death sentence

or something. I thought my life was over.”). Cannabis use appeared to facilitate appraisal of multiple stressors in the lives of these men, providing cognitive space to appraise stressors and adjust to living with the diagnosis. For example, “David” describes in Table 1 how cannabis provides “a nice little space” in which to process stressors, including the time immediately following seroconversion. Similar to previous quotes describing how cannabis afforded introspective space, this experience in some cases directly related to adjusting to a diagnosis and moving forward with the identity of a person living with HIV (“Are you going to let this control you? Are you going to do something about it?” In order to do something about it, I would have to smoke.”). Other participants such as “Jamal” describe how his cannabis use accompanied him through various such adjustment stages, summarizing how his use helps him process stigma, disclosure, and reflecting on how to begin managing the disease. The next two sections explore participants’ description of cannabis as an aid in medical management and orientation toward one’s future.

Medical Management.—The role of cannabis aiding medical management strategies differed from the previous examples of adjustment in descriptions of increased focus on tasks rather than appraisal of stressors. In general, participants maintained that cannabis helped motivate them to engage in care activities (“I was able to actually talk to people about it and go in and actually get the [medications], go to my doctor’s appointment and get stuff done so I wouldn’t be dwelling in it.”), and to take what might be described as a health promotion approach to management of HIV. Many participants spoke of juggling multiple responsibilities characteristic of emerging adulthood, including work, school, and personal relationships. Adding management of a stigmatized, chronic condition on top of other responsibilities came with challenges, but cannabis was described as a means to focus on one’s self and health. For example, “Patrick” in Table 1 describes cannabis as an aid for centering himself and being mindful of adherence at the end of the day. In such a way, introspection associated with cannabis use may connect not only to appraisal processes but also personal approaches to medical management.

Future Orientation.—Despite living with a stigmatized and chronic condition, many participants described future orientations and goal setting characterized by an overall positive outlook. Across the interviews, they discussed having plans for the future that included completing school and starting careers. For some of these young men, cannabis use was cited as something that facilitated their ability to focus on important life goals, and “Jason” maintains how “good marijuana” helped in his focus on goals and explore his creativity. For these participants, not only does the use of cannabis appear to facilitate the processing of multiple stressors in their lives, it also appears to provide cognitive “space” for them to focus on the management of HIV, accomplishment of goals, and conceiving of a future for themselves.

Interpersonal Communication

In addition to the introspective processes facilitating adjustment to and management of HIV disease, participants described improvement of interpersonal communication through cannabis use. Enhanced empathy and defused conflict via cannabis use comprised the mechanisms by which participants improved communication, usually with significant others.

Although the examples in this subsection do not address living with HIV specifically, we maintain that the improvement of such communication via cannabis use has therapeutic dimensions and benefits, particularly in the romantic relationships in which these young men were engaged. Descriptions of improved communication were related by multiple participants; however, according to “Donald” this improvement was transitory and did not extend to the period of sobriety that followed. Enhanced empathy and defused conflict extended to social settings in which living with HIV was discussed openly with friends and family while using cannabis. We discuss below how cannabis use with others aided in specific responses to living with HIV.

Social-Therapeutic Use

In a few cases, participants cited instances in which introspection regarding living with HIV combined with improved communication with family members and friends (including other persons living with HIV) through social use of cannabis. We label these phenomena as social-therapeutic through the combination of the introspective therapeutic and interpersonal communication processes described in previous sections. “Tony” in Table 1 describes “slowing down” his cognitive space through use of cannabis in a similar way that participants cited in the sections focused on introspection above, but enacting this process in a social interaction with another person living with HIV. The improvement of communication through considered reflection while using cannabis also extended to conversations with family members regarding HIV, as explained by “Jamal” in Table 1. Such examples provide insight into how cannabis may be used socially in a therapeutic manner in order to improve understanding and what it means for these young men to live with HIV.

Discussion

In the present study, we qualitatively explored perspectives on cannabis use in a diverse sample of HIV+YMSM to understand better motives for use in a population in which it is relatively prevalent. Similar to previous studies of cannabis use in (PLWH), many of our participants reported both medical and recreational use (Harris et al. 2014; Furler et al. 2004; D’Souza et al. 2012); yet our qualitative approach allowed for participants to describe motives and effects of cannabis use that bridge what has been historically thought of as medical use and recreational use in the U.S. Our findings suggest a spectrum of cannabis use by HIV+ YMSM that may be characterized not only by an overlap between medical and recreational use, but also by a distinct therapeutic domain that incorporates stress alleviation and cognitive expansion processes to improve focus on HIV management and self-care.

The therapeutic benefits of cannabis use described in our study population largely derived from introspective processes facilitated through mitigation of stressors and lead to increased focus, empathy, and improved communication. Participants described multiple stressors in their lives, including but not limited to HIV-related stress. Although previous research has documented cannabis use in the reduction of stress and anxiety (Bruce et al. 2013; Corless et al. 2009; Harris et al. 2014; Prentiss et al. 2004; Ware et al. 2003), our findings suggest that therapeutic cannabis use in this population includes cognitive expansion motives in addition to relaxation and coping motives. The cognitive space in which these processes occurred was

characterized by many participants as “slow,” in which stress-related anxiety was lessened, relaxation occurred, and secondary appraisal processes had room to emerge. Previous ethnographic research has identified motives for increased focus, attention, and concentration during leisure activities among a subset of recreational users (Osborne & Fogel 2008). ; in our study this phenomenon appears to be similarly linked to cannabis use among HIV+ YMSM appraising their ability to adjust to, manage, and live with HIV. More research is needed to further delineate how such appraisal processes may be linked to HIV continuum of care outcomes and young men’s self-care.

Despite research pointing to high rates of daily cannabis use among HIV+ YMSM, relatively little research has examined the different motives for cannabis use within this population. Although previous research on cannabis motives has assumed a recreational taxonomy of use (Simons et al. 1996; Zvolensky et al. 2007), emergent findings comparing HIV-positive and HIV-negative adult users have found that PLWH are less likely to report recreational motives as their primary reason for current cannabis use (Towe et al. 2018). In the same study, among persons who selected medical use as their primary reason for using cannabis, PLWH scored significantly higher than HIV-negative users on social and expansion motives. Persons with self-diagnosed attention deficit disorder who use cannabis to improve function, relaxation, and sociability have been reported to distinguish their use as medical and not recreational (Pedersen, 2015). Similarly, our qualitative results expand our understanding of how “recreational” motives, such as expansion, socialization, and coping may potentially map onto therapeutic motives linked to improved health outcomes. The conceptual framework we detail in Figure 1 should be assessed in further qualitative and quantitative research in order to better understand and measure these categories and their impact on HIV + YMSM’s use of cannabis. Such research may help to identify therapeutic pathways that are distinct from those previously held to be mutually exclusive medical and recreational motives.

While cannabis use has been shown not to have an adverse effect on viral load or CD4 among persons living with HIV/AIDS (Abrams et al. 2007); however, a significant concern regarding cannabis use in adolescents and young adults in general is its potential impact on brain development (Jacobus et al. 2009; Lubman et al. 2015). Further, HIV disease and cannabis use may have synergistic effects on neurocognitive functioning in PLWH, in that the effects of cannabis use on memory function appear greatest in PLWH with symptomatic HIV infection (Cristiani et al. 2004). Alternative pathways to such enhanced mindfulness merit consideration given the potentially harmful effects and dependence concerns associated with heavy cannabis use (Hanson et al. 2010; Jacobus et al. 2009; Tapert et al. 2008). Interventions incorporating transcendental meditation, mindfulness-based stress reduction techniques, guided imagery, and cognitive behavioral stress management have been shown to improve health-related quality of life and positive affect and decreased avoidance and depressive symptoms in adults living with HIV (Chhatre et al. 2013; Gayner et al. 2012; Robinson et al. 2000; Scott-Sheldon et al. 2008). Our findings suggest that adapting such interventions to reduce stressors and improve self-care among HIV+ YMSM may be an avenue for future intervention research to reduce heavy cannabis use in this population.

The data herein are qualitative and exploratory and derive from a convenience sample of 30 HIV+ YMSM receiving HIV care in two cities; thus, they may not generalize to other HIV+ YMSM and are limited by the potential for bias present in a small qualitative study. Our convenience sample also limits our ability to generalize to the larger patient population of HIV+ YMSM at each site, although the racial/ethnic breakdown in our small convenience sample roughly corresponds to the racial/ethnic distribution of the current HIV epidemic among YMSM in the U.S. (CDC, 2018). Each participant completed one interview only, so participant reports of cannabis use over time may be subject to recall bias. We were also not able to capture any changes in ecologic contexts, stressors, coping skills, and cannabis use over time. Despite legalization of cannabis in Colorado and decriminalization in Illinois, reports of cannabis use may be subject to social desirability response biases, as the interviews were conducted with participants face-to-face and in settings linked to their HIV medical care. Multiple participants described examples of medical, therapeutic and recreational use; therefore, it is important to recognize that interactions among medical, therapeutic and recreational use within an individual may be complex. Further, as the data were self-reported there is a possibility of some misclassification of categories. For example, stomach pain experienced may in some cases be somatization from anxiety or other mental health statuses (Locke et al. 2004), so that cannabis may be treating anxiety or stress associated with medication use rather than physical symptoms provoked by a medication.

Despite these limitations, our findings point to several areas for future research. First, additional research is needed to understand how different legal contexts surrounding cannabis shape the context of cannabis use for HIV+ YMSM, as we found that YMSM in Denver, where cannabis is legal, reported consuming cannabis in a greater variety of ways than did men in Chicago, where only medical cannabis is legal. Different forms of consumption may have different health implications that may be important for men living with HIV (Alzghari et al. 2017). While our findings point to a new domain of cannabis motives for HIV+YMSM, additional qualitative and mixed methods research are needed to disentangle the nexus between HIV-related stress, anxiety, and cannabis use in this population. Similarly, studies are needed to understand better how cannabis use contributes to mindfulness, introspection and self-care among HIV+YMSM. As this research proceeds, it will be important to situate these findings in the context of future pharmacological research on the potential benefits associated with cannabis and effects on cannabinoid receptors. Further, longitudinal research that captures the dynamic motives and processes that characterize cannabis use for HIV+ YMSM is needed. This type of work will be especially important for better understanding how cannabis use is related to HIV care continuum outcomes as young men adapt to living with a chronic disease and progress into adulthood and beyond.

Conclusions

This study contributes to substance use research by describing therapeutic pathways associated with cannabis use among HIV+YMSM, and it broadens our understanding of cannabis use in a population in which it is highly prevalent. In addition to more pharmacological research on medical and therapeutic applications of cannabis, more patient-centered studies are needed to deepen our understanding of different uses of cannabis in

populations living with HIV as the medical, pharmacological, legal, and policy landscapes associated with cannabis in the U.S. and worldwide continue to evolve.

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Figure 1.
Therapeutic Use of Cannabis among HIV+ YMSM

Table 1.

Therapeutic Use of Cannabis among HIV+ YMSM

Introspection	I'm just really introspective when I smoke. It causes me to replay a lot of things. So I'll look a little bit deeper at a reaction or at an area of my life than I would when I am sober. Because I've been diagnosed with ADHD ... I just don't slow down to say, "Hey, look. Let's think about that for a minute," until I'm stoned. -- "Duane," 24-year old white gay man, Denver
	It helps me slow it down and actually think about one specific thing, get it squared away, figure out what I wanna do with it, and then move on to the next thing. --"James," 23 year old Black gay man, Chicago
Adjustment to Diagnosis	It gives me a nice little space between my immediate emotional reaction and how I'm dealing with things and how I'm processing them. So in the immediate aftermath after I seroconverted, it was useful to do that to sort of prevent a panic attack or to prevent really spiraling and feeling really down on myself. --"David," 23 year old multiracial queer man, Denver
	It [marijuana] helps me come to terms with it because like in the first stages, people go through denial. Then they go through hating themselves (sic). Then they go through having to break it to people. Then they go through and having to break it to sex partners. In the first stage, I feel like it played a great part because it [marijuana] helps you take your mind off of it [diagnosis]. ...But you know you took your meds already... You're able to go throughout your day without constantly thinking about it. Then what I call the second stage, is like when you're finally coming to grips with it, it also helps you with that because it helps you embrace it. When I say embrace, it helps you know like, "Okay, I'm going to get through this. It's not that big of a deal. People live with this." --"Jamal," 24 year old mixed race gay man, Chicago
Medical Management	When I smoke, I gotta think about all the stuff that I need to take care of. Like okay, you need to make a doctor's appointment, refill your prescription, and start taking zinc pills, and stuff like that to make sure your health is good. I just wanna be, not just okay, like good good. Yeah, it does that. --"William," 23 year old Black gay man, Chicago
	The thing about HIV is taking the pill every day, you can totally forget. And if you're inundated with all these other things throughout the day, and you're not taking care of yourself, you forget to take the pill. But when I come home, it's almost like smoking is ... I'm no longer focusing on the outside world. It's me at home, just smoke and eat. So it's like -- and then when I'm grounded in my own space, I remember to take my pill. And it's like -- it helps me just to re-center myself and to remember -- focus on me. --"Patrick," 24 year old White queer man, Chicago
Future Orientation	So I have to make my goals realistic with what's going on now, and ... I be all over the place. Like, "I need to do this job. I need to apply for school." It's like I'm stretching myself. Weed just like keeps me together. It's like, "Okay, one thing at a time." I be stressed...if I don't smoke, I be all over the place, like trying to do 20 things at once. Once I smoke, I be like okay, which one is more important? Okay, I'mma start with that smoke. So that's how it goes. --"William," 23 year old Black gay man, Chicago
	Actually, when you get into that high zone after smoking some marijuana -- some good marijuana ... it just really helps you focus on your life goals, life's dreams, the things that you think about, like creativity. --"Jason," 23 year old Black gay man, Chicago
Interpersonal Communication	I was getting into a fight with my boyfriend about something minor. I don't even remember. It was something so ridiculous.... I couldn't like get over it and I was so pissed and I was like "Oh my God, I'm so mad at you. You're annoying me." Like I couldn't get over it, and then I smoked a bowl and I kind of like stepped outside myself and it kinda ... be like "What the hell am I even worried about?" Like and I apologized, and I'm like "Okay, I'm just being ridiculous right now because that has no relevance." --"Kai," 23 year old White gay man, Denver
	When I was with my boyfriend at the time, we'd smoke, and I'd just feel so much more connected to him. And I feel like I had more empathy, and I felt like I loved him more than I maybe did. And I felt like we could relate better, and our interaction together was great. I didn't really have an ego going on. ...And then, when I'd come off of it, I'd be who I was before, and ego would go up again. I'd put up my walls and boundaries and things like that. --"Donald," 24 year old Black same gender loving man, Denver
Social-Therapeutic	I was with one of my other HIV-positive friends, and we were at a park smoking. Yeah, we were just talking things out about -- first, we were talking negatively about HIV and how shitty it is to live with it. Then when we smoked, we talked about how to advocate ... it just changed the way I was thinking about things. Instead of being in that negative light, it makes you slow down. That's what I see it as, it slows me down. It slowed us down. --"Tony," 21 year old Latino gay man, Denver
	I was smoking one time with my aunt and she was telling me about how she don't believe that I have HIV. She was telling me that she thinks that it's the bacteria mold in the apartment that she was living in and she was saying that's probably why I tested positive. I'm sitting there trying to tell her. I'm like, "I tested positive because I had unprotected sex. You cannot catch HIV from bacteria mold. You can get gastritis, proctitis. It can probably enhance my pancreatitis, but you can't get HIV with it." Talking to her about it, it really helped me come to terms with it because that was like the first time that I said it out loud and I was really passionate about it. I was like, "It's not a big deal." ...[but] she don't understand the whole undetectable thing. So, she was like, "So, you mean to tell me that now you just don't have it?" I was like, "No. It's just like certain tests. It won't come up. They will have to do a specific test to see if I had it and count my cells." Then she kind of rested on it and we smoked again. So, I feel like had I not smoked, that conversation would have been very emotional and it probably would have took a turn to the left. --"Jamal," 24 year old mixed race gay man, Chicago