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A comparison of motivations for marijuana use in HIV-positive and HIV-negative adults

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Abstract

While medicinal marijuana use is common among persons with HIV, it is not known whether persons with HIV are more motivated to use marijuana medically compared to HIV-negative counterparts. This study examined motivations for marijuana use in a sample of 94 HIV+ and HIV- adults. Participants used marijuana 21.27 days in the last 30 days on average. HIV+ participants reported using marijuana for medical reasons more often than HIV- participants, but HIV+ and HIV- participants did not differ in other domains. Problematic marijuana use was associated with motives, regardless of HIV status. Motives were associated with mental and physical health functioning, but there were no interactions between motivations and HIV status. Overall this study found that motivations were similar for HIV+ and HIV- participants. Future research including qualitative work to further understand motivations would benefit the field, as would research examining the effectiveness of marijuana in treating physical symptoms.

Keywords

marijuana; cannabis; marijuana use motives; HIV/AIDS; marijuana use disorders

Introduction

Marijuana remains the most commonly used illicit drug in the United States. National epidemiological data shows that 8.3% of Americans (22.2 million persons) aged 12 or older were current marijuana users in 2015 [1], and that 1.5% (4.0 million persons) had a marijuana use disorder in the past year, based on criteria for substance abuse and dependence from the Diagnostic and Statistical Manual of Mental Disorders-IV-Text

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Compliance with Ethical Standards: Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

Revision (DSM-IV-TR) [2]. While the prevalence of marijuana use had remained stable from 2002-2013, the data from 2014 and 2015 reflect increased rates of use, particularly among adults aged 26 and older [1]. Among persons living with HIV (PLWH), rates of marijuana use are significantly higher, with prevalence estimates ranging between 20-60% [3-9]. In addition, the rates of marijuana use disorder amongst PLWH may be significantly higher than in the general population [6].

One driving factor for this difference in prevalence rates may be the purported medicinal benefits of marijuana. For PLWH, potential therapeutic effects of marijuana include alleviating HIV-related physical symptoms (e.g., wasting and pain), as well as ameliorating adverse effects of antiretroviral therapy (ART). Though there is still a need for conclusive evidence that marijuana may lead to decreased morbidity and mortality for PLWH [10,11], some research has supported that marijuana has medicinal benefits for PLWH [e.g., 12,13,14]. Given the potential benefits, there has been a trend toward the decriminalization and legalization of medical marijuana use in the United States. To date, 29 states and the District of Columbia have passed legislation for the legalization of medical marijuana use [15]. While the state-specific laws vary in terms of approved conditions for marijuana use, HIV or symptoms associated with HIV are specifically listed as an approved condition in all states.

Recreational and medicinal use are not mutually exclusive. Recent research using a representative sample from 4 different states showed that approximately 86% of individuals who had used marijuana medicinally in their lifetime had also used it recreationally, and half of past-month medical marijuana users reported using for both medical and recreational purposes [16]. Among PLWH, research suggests that the prevalence rates may be similar, with many still using marijuana recreationally in addition to using for medical reasons [17-19]. One large study of HIV+ women showed that 55% of current marijuana users reported medical marijuana use, with 26% reporting medical use only and 29% reporting both medical and recreational use [3].

Despite growing evidence that medicinal marijuana use is common among PLWH, it is not known whether they are more motivated to use marijuana for medical purposes compared to HIV-negative counterparts. This is the first empirical investigation of motives for marijuana use in a community sample of HIV+ and HIV- persons. This study was conducted in North Carolina, which - like most states in the US South – has not legalized medical marijuana. Therefore, all participants were using marijuana illicitly, eliminating the potential confounding of legalized use. We hypothesized that HIV+ persons would be more likely than HIV- persons to report medical motives for marijuana use, and that medical motives would relate to both problematic use and current health status.

Methods

Participants

Data for this study were drawn from two protocols with shared procedures that examined the neurocognitive effects of HIV infection and drug abuse. The sample includes 94 adults aged 18 years or older who were active marijuana users with HIV or without HIV. Inclusion

criteria were: any marijuana use in the past 30 days, English fluency and literacy, ≥8th grade education, and no signs of acute psychiatric distress (such as active hallucinations or suicidal ideation). Alcohol and other drug use were permitted, but participants could not have a current diagnosis of dependence for any substance other than marijuana, as defined by the DSM-IV-TR. HIV-negative status was verified by an OraQuick© rapid HIV test, and self-reported HIV-positive status was verified by medical record review.

Procedures

Participants were recruited from the Raleigh-Durham area via advertisements in local newspapers, websites, community-based organizations, and infectious diseases clinics. To assess preliminary eligibility for the study, interested participants completed a brief pre-screening interview, typically over the phone. Participants who passed the pre-screener were then invited for an in-person screening visit. At the in-person visit, all participants provided written informed consent and then completed several clinical interviews, questionnaires, and a urine drug screening. All questionnaires were administered via an audio computerized assisted self-interview (ACASI). Study procedures were approved by the institutional review board at Duke University Health System.

Measures

Substance use assessment—Module E of the Structured Clinical Interview for DSM-IV-TR (SCID-E) identified current substance dependence [20]. The Addiction Severity Index-Lite (ASI-L), a semi-structured interview, assessed lifetime substance use (e.g., age of first use) and associated impairments in multiple areas (including medical history) [21]. Days of substance use in the past 90 days was assessed using the timeline follow-back method [22,23] and participants self-reported on other frequency indices of marijuana use (e.g., average hours high per day). An on-site urine toxicology screen (CLIAwaived, Inc. 9-Panel Rapid Dip Drug Test) was used to corroborate self-report of recent drug use for 9 substances: cocaine, cannabis (tetrahydrocannabinol or THC), amphetamine, methamphetamine, oxycodone, methadone, other opioids (including heroin), benzodiazepines, and barbiturates.

Marijuana motives—An adapted version of the Marijuana Motives Measure (MMM) assessed motivations for marijuana use [24]. The original 25-item questionnaire includes five subscales: social (e.g., “to celebrate a special occasion with friends”), coping (e.g., “because it helps me when I'm depressed or nervous”), enhancement (e.g., “because it gives me a pleasant feeling”), conformity (e.g., “to fit in with a group I like”), and expansion (e.g., “to understand things differently”). In this study, 6 new items were added to create a subscale assessing medical motivations for use: “to relieve symptoms of HIV or other chronic illness,” “to aid relaxation,” “to relieve pain,” “to obtain energy,” “to decrease nausea,” and “to increase appetite.” These items were selected based on prior research showing that these are common medical benefits of marijuana use reported in HIV+ samples [18,25-27] and non-HIV samples [28-30]. The items we selected share some overlap with a new health subscale created for an adolescent sample, though this study was not published until after data collection for our project was completed [31]. Items from their study that overlap with our subscale include “to feel more energetic” and “to have a better appetite”,

and items unique to their scale include “to sleep better,” “to feel in better form,” and “to feel healthier” [31].

For the MMM, the 5-point response scale ranges from 1 (never or almost never) to 5 (always or almost always). Item responses for each subscale were averaged to compute a subscale score, with higher scores indicating using marijuana more often for each motive. In the full sample, Cronbach's alpha for the MMM subscales ranged from 0.71 to 0.89 (coping = 0.89, conformity = 0.71, social = 0.88, enhancement = 0.88, expansion = 0.88, and medical = 0.83). To ensure that the groups were comparable, we also examined Cronbach's alpha for the MMM subscales in HIV+ and HIV- participants separately. For the coping, social, enhancement, and expansion subscales, the alphas were similar, and all above 0.80, for HIV + and HIV-participants. Cronbach's alpha was 0.61 in HIV+ and 0.76 in HIV- participants for the conformity scale, and 0.89 in HIV+ and 0.72 in HIV- participants for the medical subscale.

We also asked participants to select their primary reason for initial marijuana use and current marijuana use from the following options: physical symptoms, recreation, mental health, and other. Participants who selected “other” were asked to provide their reason in free text. Two authors reviewed all the “other” responses and independently coded them into the available categories. In some cases, the free text response was consistent with the available categories (e.g., “to party and feel good” was consistent with recreation). The most frequent “other” response was consistent with peer pressure or conformity, so this was added as a category. These two authors then met with a third author to discuss discrepancies and reach a consensus for each response.

Other measures—A modified version of the 36-Item Short Form Health Survey Version 2 (SF-36v2) assessed past month physical and mental health functioning [32]. The SF-36v2 is a reliable and well-validated measure that has been used extensively with HIV+ populations [e.g., 33,34,35]. The measure is comprised of eight subscales: Physical Functioning, Role-Physical (role limitations due to physical health), Bodily Pain, General Health (perception of health), Vitality (energy/fatigue), Mental Health, Social Functioning, and Role-Emotional (role limitations due to mental health). Using published scoring procedures [36], raw scores were transformed to a 0-100 scale with higher scores indicating better health status. The Mini International Neuropsychiatric Interview identified mood, anxiety, and psychotic disorders and assessed acute psychiatric symptoms (including suicidality) [37]. Healthcare records were reviewed to obtain medical history and, if applicable, HIV disease indicators (e.g., CD4 cell counts). HIV+ participants also self-reported on their history of HIV staging (e.g., CD4 cell counts, opportunistic infections) and treatment. Finally, participants reported demographic characteristics, including age, gender, race, and education.

Data analysis plan

Descriptive statistics were used to characterize the sample. Differences between HIV+ and HIV- participants on demographic and substance use variables were examined using chi-square and two-tailed independent samples t-tests. We also used two-tailed independent sample t-tests to examine the differences between HIV+ and HIV- participants on the mean

subscale scores from the MMM. To examine the additive role of substance dependence, we examined differences between groups on MMM subscales using a series of 2 (HIV status: HIV+/HIV-) × 2 (Current marijuana dependence: Yes/No) between-subjects general linear model analyses. Finally, we used 2 (HIV status: HIV+/HIV-) × 3 (Reason for current use: Physical, recreation, mental health) between-subjects general linear model analyses to examine how health status differed between participants based on HIV status and primary motivation for current marijuana use. To probe group differences in reason for current use in these final analyses, Tukey's Honestly Significant Difference (HSD) post-hoc comparisons were used. Statistical significance was defined as p-value of less than 0.05. All analyses were conducted in SPSS 24.0. While our dataset generally had very little missing data, for any variables with missing values, the available sample size has been reported with the statistical test result.

Results

Participant characteristics

The final sample included 94 adults who were mostly male (68%), African American (72%), and 35.49 years old on average (SD = 9.57). As shown in Table 1, there were no statistically significant differences between HIV+ (n = 44) and HIV- (n = 50) participants on demographic, marijuana, and other substance use characteristics. Participants were generally frequent marijuana users, with 21.27 days of use (SD = 10.86) in the last 30 days, and they reported spending 4.98 hours high per day on days that they used (SD = 4.49). The large majority of participants (87%) had THC-positive urine test results. Participants reported an average of 13.45 years of regular use (SD = 9.48). The average age of marijuana use initiation was 16.72 years (SD = 4.54). The average age of regular marijuana use was 19.98 (n = 92, SD = 6.04), with 39% of the sample reporting that they first used marijuana regularly before age 18.

HIV+ participants had been diagnosed with HIV for a mean of 9.80 years (SD = 8.57). The average age of diagnosis was 27.59 (SD = 8.71), and 21% reported that their regular marijuana use began after their HIV diagnosis (with 79% reporting regular use before their diagnosis). All participants were in HIV care, and all but 2 were currently on antiretroviral therapy. More than a third (n = 43, 37%) had an AIDS diagnosis, and 41% (≥50 copies/mL). The median most recent CD4 cell count was 561 cells/mm^3 (n = 42, IQR = 381) and the median nadir CD4 was 248 cells/mm^3 (n = 43, IQR = 286).

Among HIV- participants, 28% (n = 14) self-reported “Yes” when asked if they have a chronic medical condition on the ASI. HIV- participants reported 6.96 (SD = 10.52) days of medical problems in the past 30 days on the ASI, which was not significantly different from HIV+ participants, who reported 9.30 (SD = 11.63) days of medical problems [$t(92) = 1.02$, $p = 0.309$]. Of the 50 HIV- participants, we reviewed medical records for 35 individuals. The other 15 participants had received care from a clinic from which we were unable to get records. Among the 35 records we did review, 21 participants (60%) had a some kind of pain included on their problems list in their medical record, which was comparable [$\chi^2(1) = 0.24$, $p = 0.627$] to the HIV+ group (n =24, 55%).

Group comparisons on motivations for marijuana use

On the MMM, HIV+ participants' scores on the medical subscale were significantly higher than scores for HIV- participants ($p = 0.002$), but the groups did not differ on other MMM subscales (Table 1). Most participants reported that their primary reason for initiating marijuana use was recreation (61%), followed by conformity (20%), mental health (11%), and physical symptoms (9%); there was no difference between HIV+ and HIV- participants on primary reason for initiation of marijuana use [$\chi^2(3) = 1.86$, $p = 0.602$]. However, there was a significant group difference for primary reason for current marijuana use [$\chi^2(2) = 6.45$, $p = 0.040$], with HIV+ participants being more likely than HIV- to report physical symptoms (39% vs. 20%) and mental health (25% vs. 18%) and less likely to report recreation (36% vs. 62%).

In a sub-analysis of participants who selected physical symptoms as their primary reason for current marijuana use, means across all MMM subscales were higher for HIV+ participants compared to HIV- participants. These differences were significant for social [bHIV+ = 2.55 and HIV- = 1.60, $t(25) = 2.30$, $p = 0.030$] expansion [HIV+ = 2.44 and HIV- = 1.40, $t(25) = 2.12$, $p = 0.044$] and medical motives [HIV+ = 3.95 and HIV- = 2.62, $t(25) = 3.35$, $p = 0.003$] There was no difference between mean MMM subscale scores based on HIV status among participants who selected recreation as their primary reason for current use (all $p > 0.15$) or among those who selected mental health (all $p > 0.10$).

Association between motivations and marijuana dependence

In the 2 (HIV status) × 2 (Current marijuana dependence) between-subjects general linear model analyses, there were significant main effects for dependence for social, coping, enhancement, expansion, and medical motives, but not conformity. As shown in Table 2, mean subscale scores were higher for participants with marijuana dependence. There was only a significant main effect of HIV for the medical motive subscale. There were no significant HIV × Dependence interaction effects for any subscale (all $p > 0.10$). Given our relatively small sample size, we examined effect sizes for the interaction term for each subscale. Small effect sizes were detected for the coping ($\eta_p^2 = .021$), expansion ($\eta_p^2 = .019$), and medical subscales ($\eta_p^2 = .024$). Effect sizes for the conformity, social and enhancement subscales indicated minimal effect (all $\eta_p^2 < .01$).

To ensure that the significant main effects for dependence were not a function of use frequency, we repeated the 2×2 models with days of marijuana use in the past 30 days entered as a covariate. The only difference with the addition of the covariate was that main effects for dependence were significant for all MMM subscales, including conformity (all $p < 0.05$).

Association between motivations and health status

A series of 2 (HIV status: HIV+/HIV-) × 3 (Reason for current use: Physical, recreation, mental health) between-subjects general linear model analyses were conducted to examine how current primary motivation for use and HIV status impact health status as measured by the SF-36v2. Means, standard deviations, and main effects are presented in Table 3. Six of the 8 subscales showed significant main effects for current use motive. Post-hoc

comparisons using Tukey's HSD examined which means significantly differed from one another based on primary motive for current use. For Physical Functioning, Role-Physical, and Bodily Pain, individuals using marijuana primarily for physical symptoms had significantly lower mean scores than those using for recreation (all $p < 0.001$) or mental health reasons (all $p < 0.001$). For General Health, the mean score for those using marijuana for physical symptoms was significantly lower than the mean score of those using recreationally ($p < 0.001$), but the scores for those using for mental health reasons did not differ from the scores for either other motive (both $p > 0.05$). For Social Functioning, individuals using recreationally scored significantly higher than those using for physical symptoms and those using for mental health reasons (all $p < 0.005$). For Role-Emotional, the mean score for those using marijuana for physical symptoms was significantly higher than the mean score of those using recreationally ($p = 0.039$) and those using for mental health reasons ($p = 0.002$).

There were 3 subscales that showed significant main effects for HIV status, such that the mean scores were significantly lower for HIV+ participants compared to HIV- participants: Bodily Pain [HIV+ $M = 63.61$, $SD = 32.75$, and HIV- $M = 79.64$, $SD = 26.26$] General Health [HIV+ $M = 55.57$, $SD = 15.41$, and HIV- $M = 67.40$, $SD = 12.99$] and Vitality [HIV+ $M = 54.12$, $SD = 23.81$ and HIV- $M = 65.75$, $SD = 18.65$]. There were no significant interaction effects for any SF-36v2 subscale.

Discussion

This study found that motivations for marijuana use were similar for HIV+ and HIV- participants in most domains. While HIV+ participants did report using for medical reasons more often than HIV- participants, they did not differ across other MMM subscales, including social, coping, enhancement, conformity and expansion. The majority of participants reported recreation as the primary reason for initiating marijuana use, and there were no statistically significant differences between HIV+ and HIV- participants on reason for initiating use, age of first ever use, and age of first regular use. However, there were significant differences for primary reasons for current use, with HIV+ participants being more likely to select physical symptoms and less likely to select recreation. Among those who indicated physical symptoms as their primary motivation for current use, HIV+ participants had higher MMM scores across all subscales with significant differences in social, expansion, and medical subscales, despite similar frequency of marijuana use. This suggests that, among this sub-group of primary medical marijuana users, HIV+ participants appear to be using marijuana for multiple reasons simultaneously, whereas HIV- participants use primarily for medical reasons only. There were no significant differences between HIV+ and HIV- participants on MMM subscale scores among those who selected recreation or mental health as their primary reason for current use.

Despite the high frequency and chronicity of marijuana use, less than half of our community-recruited sample met criteria for marijuana dependence. Participants with marijuana dependence scored higher on the MMM subscales than those without dependence, but there were no interaction effects between dependence and HIV status. These results indicate that problematic use is associated with self-reported motivations for use, with no

significant differential effects based on HIV status. However, small effect sizes were detected for the coping, expansion, and medical subscales, so it is possible that significant effects might be found in a larger sample. Overall, our findings are consistent with prior research that suggests drug use motives are associated with not only use, but also problematic use [24,29,38,39].

Motives for current use were strongly associated with mental and physical health functioning on the SF-36v2, with 6 of the 8 subscales having significant main effects of current motive for use. Participants who identified physical symptoms as the primary motivator for current marijuana use were significantly more likely to have poorer physical health across multiple subscales of the SF-36v2. While HIV+ participants did have lower scores for overall health status, bodily pain, and vitality, there was no interaction between HIV status and primary motive. This means that among participants who reported physical symptoms as their primary motive for current marijuana use, rates of endorsed physical symptoms did not differ between HIV+ and HIV- participants. On the other hand, participants who identified recreation as their primary motive for marijuana use had better social and emotional functioning than those who identified physical symptoms or mental health symptoms as their primary motive.

The principal strengths of this study include a well-characterized sample of HIV+ marijuana users with a demographically-similar HIV- comparison group of marijuana users who also experienced regular medical problems, including pain. The sample was comprised of current marijuana users, and individuals with alcohol and other drug dependence were excluded to minimize the potential effects of poly-substance use on motives for use. This study also had several limitations. First, the medical subscale included in this study was created by this team and has not been validated previously. While the items were added based on the literature, the scale itself was not subjected to rigorous evaluation prior to implementation in this study. Therefore, future research should carefully assess which items would be best to assess medical motives for use. Our assessment of primary reason for use involved a simple, single-item face-valid question, but as our MMM subscale scores indicate, motivations for use are much more complex. For marijuana users who develop problematic use patterns, understanding motivations for use more fully is an important step for informing treatment development for marijuana use disorders. Given our modest sample size, it is possible that we were underpowered to detect small effects that are nevertheless clinically meaningful. Replication of our findings in a larger multi-site trial is an important next step. Additionally, future research that includes qualitative work to better understand the interplay of different motivations for use would be highly informative for the field.

In addition, while self-reported motivations for marijuana use are important to understand, one pragmatic question that needs to be addressed is whether marijuana is in fact an effective tool for managing physical symptoms. Because this study was cross-sectional, we are not able to address this question. Our study does show that a large proportion of persons use marijuana primarily, or at least in part, for perceived medical benefits, and this was especially true of HIV+ persons. Longitudinal research is needed to examine the effectiveness of marijuana in alleviating and potentially improving physical symptoms over time. Understanding when marijuana may be medically beneficial (and importantly when it

may not be) is necessary to inform physician recommendations as well as public perceptions of marijuana as medicine.

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Table 1
Participant characteristics of the two study groups (*N*=94)

	HIV-(*n* = 50)	HIV+ (*n* = 44)	Statistic
Demographic and other characteristics			
Gender, *n* (%)			$\chi^2(2) = 2.32$
Male	32 (64%)	32 (73%)	
Female	18 (36%)	11 (25%)	
Transgender	0 (0%)	1 (2%)	
Age in years, *M* (*SD*)	33.82 (8.46)	37.39 (10.47)	$t(92) = 1.83$
Race, *n* (%)			$\chi^2(2) = 4.97$
African American	39 (78%)	29 (66%)	
Caucasian	6 (12%)	13 (30%)	
Other/Mixed	5 (10%)	2 (5%)	
Hispanic ethnicity, *n* (%)	2 (4%)	3 (7%)	$\chi^2(1) = 0.37$
Education in years, *M* (*SD*)	13.10 (2.27)	13.34 (2.47)	$t(92) = 0.49$
Marijuana use characteristics			
Days of marijuana use in past 30 days, *M* (*SD*)	21.26 (10.94)	21.27 (10.89)	$t(92) = 0.01$
THC-positive urine drug result, *n* (%)	41 (82%)	41 (93%)	$\chi^2(1) = 2.63$
Current marijuana dependence, *n* (%)	22 (44%)	17 (39%)	$\chi^2(1) = 0.28$
Years of marijuana use, *M* (*SD*)	12.40 (8.34)	14.64 (10.61)	$t(92) = 1.14$
Age of first ever use, *M* (*SD*)	16.68 (4.04)	16.77 (5.09)	$t(92) = 0.10$
Age of first regular use, *M* (*SD*)	19.78 (5.93)	20.21 (6.23)+	$t(90) = 0.34$
Hours high per day, *M* (*SD*)	5.40 (4.74)	4.50 (4.19)	$t(92) = 0.97$
Other substance use characteristics			
Any alcohol use, *n* (%)	37 (74%)	32 (73%)	$\chi^2(1) = 0.02$
Days of use, *M* (*SD*)	6.03 (7.26)	5.06 (6.73)	$t(67) = 0.57$
Any nicotine use, *n* (%)	31 (62%)	31 (72%)	$\chi^2(1) = 1.06$
Days of use, *M* (*SD*)	26.48 (8.67)	26.87 (7.84)	$t(60) = 0.18$
MMM subscale scores			
Social, *M* (*SD*)	2.33 (1.11)	2.45 (1.08)	$t(92) = 0.54$
Coping, *M* (*SD*)	2.39 (1.20)	2.46 (1.24)	$t(92) = 0.30$
Enhancement, *M* (*SD*)	3.37 (1.16)	3.26 (1.17)	$t(92) = 0.47$
Conformity, *M* (*SD*)	1.17 (0.49)	1.17 (0.39)	$t(92) = 0.05$
Expansion, *M* (*SD*)	2.05 (0.97)	2.13 (1.15)	$t(92) = 0.38$
Medical, *M* (*SD*)	2.31 (0.88)	3.02 (1.26)	$t(92) = 3.21^{**}$

* p < 05,

** p < 01

+ Age of first regular use is missing for 2 HIV+ participants.

Note. M = Mean; SD = Standard deviation.

Table 2

MMM subscale score means (standard deviations) by HIV status and marijuana dependence (*N*=94)

MMM Subscale	No Current Dependence			Current Dependence			Main
	HIV+ (*n* = 27)	HIV- (*n* = 28)	Total (*n* = 55)	HIV+ (*n* = 17)	HIV- (*n* = 22)	Total (*n* = 39)	HIV *F*(1, 9)
Social	2.11 (0.86)	1.98 (0.94)	2.04 (0.90)	3.00 (1.19)	2.78 (1.16)	2.88 (1.16)	0.66
Coping	1.84 (0.66)	1.94 (1.03)	1.89 (0.86)	3.46 (1.31)	2.95 (1.18)	3.17 (1.24)	0.84
Enhancement	2.90 (1.12)	2.9 (1.22)	2.92 (1.16)	3.82 (1.06)	3.94 (0.82)	3.89 (0.92)	0.09
Conformity	1.15 (0.37)	1.06 (0.17)	1.10 (0.29)	1.21 (0.42)	1.31 (0.69)	1.27 (0.58)	< 0.01
Expansion	1.77 (0.85)	1.89 (1.04)	1.83 (0.95)	2.71 (1.33)	2.25 (0.84)	2.45 (1.09)	0.63
Medical	2.67 (1.24)	2.20 (0.91)	2.43 (1.10)	3.57 (1.13)	2.45 (0.83)	2.94 (1.11)	13.36***

* p < .05,

** p < .01,

*** p < .001

Table 3

SF-36v2 subscale score means (standard deviations) by HIV status and primary motive for current use (*N*=94)

SF-36v2 Subscale	Physical Symptoms			Recreational			Mental Health		
	HIV+ (*n* = 17)	HIV (*n* = 10)	Total (*n* = 27)	HIV+ (*n* = 16)	HIV- (*n* = 31)	Total (*n* = 47)	HIV+ (*n* = 11)	HIV- (*n* = 9)	Total (*n* = 20)
Physical Functioning	55.29 (34.21)	62.00 (35.21)	57.78 (34.06)	94.06 (9.35)	89.84 (18.55)	91.28 (16.03)	83.18 (20.89)	94.44 (8.46)	88.25 (17.11)
Role-Physical	56.99 (29.72)	57.50 (37.24)	57.18 (32.00)	91.80 (12.23)	90.32 (19.55)	90.82 (17.28)	80.68 (24.91)	88.89 (17.05)	84.38 (21.60)
Bodily Pain	40.53 (32.85)	58.40 (39.43)	47.15 (35.77)	80.44 (17.70)	83.81 (19.72)	82.66 (18.93)	74.82 (30.30)	88.89 (16.97)	81.15 (25.62)
General Health	50.29 (12.68)	59.50 (16.24)	53.70 (14.52)	61.25 (13.84)	70.97 (11.72)	67.66 (13.18)	55.45 (19.42)	63.89 (8.94)	59.25 (15.83)
Vitality	48.16 (24.08)	66.88 (19.99)	55.09 (24.08)	60.16 (15.46)	68.15 (16.56)	65.43 (16.48)	54.55 (32.12)	56.25 (22.96)	55.31 (27.68)
Mental Health	67.35 (22.23)	78.00 (13.98)	71.30 (19.98)	72.81 (17.12)	80.81 (12.66)	78.09 (14.65)	64.09 (27.37)	65.00 (24.75)	64.50 (25.54)
Social Functioning	55.15 (28.66)	72.50 (31.62)	61.57 (30.41)	83.59 (20.27)	87.10 (19.76)	85.90 (19.78)	61.36 (35.11)	66.67 (21.65)	63.75 (29.22)
Role-Emotional	72.55 (24.61)	90.83 (18.61)	79.32 (23.95)	87.50 (17.48)	93.82 (12.17)	91.67 (14.33)	73.48 (30.92)	71.30 (26.72)	72.50 (28.37)

* $p < .05$,

** $p < .01$,

*** $p < .001$