Published in final edited form as:

AIDS Care. 2016 December ; 28(12): 1559–1565. doi:10.1080/09540121.2016.1198746.

High levels of self-reported prescription opioid use by HIV-positive individuals

Abigail Norris Turner, PhD¹, Courtney Maierhofer, MPH¹, Nicholas T. Funderburg, PhD², Brandon Snyder¹, Kristi Small¹, Jan Clark, PharmD¹, Jose A. Bazan, DO¹, Nicole C. Kwiek, PhD³, and Jesse J. Kwiek, PhD^{4,†}

¹Division of Infectious Diseases, College of Medicine, the Ohio State University

²Division of Medical Laboratory Science, School of Health and Rehabilitation Sciences, the Ohio State University

³Division of Pharmacology, College of Pharmacy, the Ohio State University

⁴Department of Microbial Infection and Immunity, College of Medicine, and Department of Microbiology, College of Arts and Sciences, the Ohio State University

Abstract

Prescription medication use (other than antiretroviral therapy (ART)) is highly prevalent among people living with HIV. Prescription medications may be used medically or non-medically: non-medical use includes using more medication than prescribed, using medication prescribed to someone else, or using medication for a purpose other than its prescribed use. During 12 weeks in 2014–15, we characterized medical and non-medical prescription medication use among HIV-positive patients attending an academic medical center (n=149) and a community clinic (n=105). Separately for the past year and the past month, these 254 participants self-reported their use of prescription opioids, sedatives, stimulants, anti-anxiety medications, antipsychotic medications, and erectile dysfunction medications. Respondents were largely male (91%), aged 40 or older (61%), identified as gay or bisexual (79%), and were men who have sex with men (MSM, 85%). ART use was nearly universal (95%). Nearly half (43%) of participants overall reported medical use of prescription opioids in the last year; 11% of the opioid use was reported as non-medical use. Anti-anxiety medication use in the last year was also frequent, and differed by site: in the last year, 41% of community clinic responders reported medical use of anti-anxiety medications compared to 23% of hospital clinic respondents who reported medical use. Prescription sedative use in the last year was also approximately twice as high among community-clinic participants, with medical use reported by 43% of respondents and non-medical use by 12%; in comparison, at the hospital clinic, sedative use was reported by 18% (medical) and 7% (non-medical) of participants in the last year. Stimulant use was rare in both sites. No demographic characteristic was significantly associated with medical or non-medical use of any prescription medication. The current focus of many studies on only non-medical prescription medication use not only underestimates the widespread exposure of HIV-positive individuals to these drugs, but may also underestimate potential adverse effects of prescription medications in this population.

[†]Corresponding Author. Jesse J. Kwiek, PhD, 788 Biomedical Research Tower, 460 West 12th Avenue, Columbus, OH 43210, kwiek.2@osu.edu; T: (614) 292-3256; F: (614) 292-9616.

Keywords

HIV; prescription medication; opioids; non-medical use; medical use; ART

INTRODUCTION

Use of illicit drugs such as heroin, cocaine, and methamphetamine has been associated with risky sexual behavior (Boone, 2013; Carey, 2009; Celentano, 2008). In people living with human immunodeficiency virus (HIV) type 1, illicit drug use has also been associated with reduced antiretroviral (ART) adherence (Colfax, 2005; Hinkin, 2007; Horvath, 2013). Although epidemiological studies linking illicit drug use to HIV disease progression have yielded mixed findings, laboratory studies have provided biologically plausible mechanisms to explain how certain illicit drugs may influence HIV disease progression (reviewed in Kapadia, 2005).

Since the turn of the 21st century, patterns of drug use and abuse in the United States (US) have undergone a major shift (Johnston, 2010). A growing number of individuals now engage in both medical and non-medical use of prescription medications, including opioids (such as oxycodone), stimulants (such as dextroamphetamine), and central nervous system depressants (such as diazepam) (Kelly, 2010; McCabe, 2009; Vijayaraghavan, 2014). *Non-medical* use of prescription drugs, which includes using more medication than prescribed, using medication prescribed to someone else, or using medication for a purpose other than its prescribed use, has been linked to risky sexual behavior (McCauley, 2010). For example, men who have sex with men (MSM) who reported recent non-medical use of prescription drugs had more sex partners and more unprotected anal sex than MSM who did not misuse prescription medication (Benotsch, 2011; Kelly, 2010).

To date, the sparse literature on prescription drug use among HIV-positive individuals has focused largely on non-medical use, and on HIV-positive populations recruited in higher risk environments. By measuring only non-medical use, the existing research likely underestimates overall exposure of HIV-positive individuals to prescription medications. In addition, because several prescription medications have almost identical pharmacology to illicit drugs, use of prescription medication could have effects on patient behavior and HIV disease progression similar to those of the use of illicit drugs. These effects would most likely correlate with the dose and duration of use of medication, but not with characterization of that use as medical or non-medical. Thus, to better understand the scope and magnitude of use of prescription medication in an “in care” population of people living with HIV, we characterized the prevalence of both medical and non-medical prescription drug use among HIV-positive patients attending either an urban, academic medical center or community-based AIDS service organization.

METHODS

Study setting, design and population

This cross-sectional, self-administered survey took place in two sites. The first site collected data during November 2014 and April 2015 in the infectious diseases (ID) clinic of a large, urban academic medical center (hereafter called hospital clinic). The second site collected data over a three-week period during July and August 2015 in a community-based AIDS service organization that provides HIV medical care and support services (hereafter called community clinic). Any patient aged 18 or older was eligible to participate. Staff gave the paper survey and an empty, unmarked envelope to all patients at registration. Patients were informed that their responses would not be shared with their medical providers, and were instructed not to write their names or other identifying information on the form or envelope. After completion, each participant placed the completed survey in the envelope and deposited it in a locked, metal box in the clinic. No additional recruitment was performed, no personal identifiers were collected, and no compensation was provided. Given this design, we did not collect information on the number of potential participants who declined to complete the survey. Of the 233 people who completed the survey at the hospital clinic, 149 were HIV-positive by self-report and are included in the analysis population. Of the 126 people who completed the survey at the community clinic, 105 were HIV-positive and were included in the analysis; the remainder were HIV-negative individuals seeking HIV testing services or HIV pre-exposure prophylaxis (PrEP).

Measures

We first asked participants about their use of medications that had been prescribed to them by a medical provider (survey available upon request). We asked about use of each category of medication prescribed in the preceding 12 months and in the preceding 1 month, and we specified that these questions were assessing actual use of medication and not simply the receipt of a prescription for the medication. Specific medication categories queried included prescription sleep aids or sedatives (e.g., Ambien, Amytal, Numbutal, Seconal), attention deficit/hyperactivity disorder (ADD or ADHD) medications (e.g., Ritalin, Adderall, Concerta), panic or anxiety medications (e.g., Valium, Xanax, Klonopin, Halcion, Librium, Tranxene, Ativan and Serax), antipsychotic medications (e.g., Zyprexa, Seroquel and Haldol), erectile dysfunction medications (e.g., Viagra [blue pills, blue], Cialis and Levitra), and opioid pain medications (e.g., OxyContin [oxy, cotton], Percocet [percs], Vicodin [vikes, Vikings], and Codeine). Next, we asked about the same list of medications, but specifically about their non-medical use. Finally, we asked participants about their use of other legal (alcohol, tobacco) and illegal drugs (marijuana, methamphetamine, MDMA, heroin, cocaine (including crack cocaine), 'bath salts,' poppers, rohypnol, mephedrone, ketamine and GHB).

Data management and analysis

Responses from paper surveys were entered into a database and imported into SAS (Version 9.4, Cary NC) for analysis. We used descriptive statistics to examine the frequency of medical and non-medical use of prescription medications and illicit drugs.

Ethical approval

The Ohio State University Institutional Review Board (IRB) determined that this study was exempt from IRB review (protocols 2014E0530 and 2014E0628).

RESULTS

Participant characteristics

Reflecting the demographics of the local HIV epidemic, the 254 HIV-positive respondents were largely male (91%), aged 40 or older (61%), white (69%), and men who have sex with men (MSM, 85%). Seventy percent of participants had attended at least some college, and 95% were currently taking ART. Although respondents at the two clinics differed by age and education level, sex at birth, ethnicity, sexual orientation, and ART use were similar between the hospital clinic and community clinic (Table 1).

Medical and non-medical use of prescription medication

Of the six prescription medication categories queried for use in the preceding year, survey respondents at both clinics used opioid pain medications most commonly: 43% overall reported medical use of prescription opioids and 11% reported non-medical use in the last year (Table 2). The frequency of medical and non-medical opioid use in the last year was similar between clinics (medical use, $p=0.1$; non-medical use, $p=0.3$). Use of anti-anxiety medications in the last year was also frequent, with 23% reporting medical use and 8% reporting non-medical use in the hospital clinic and 41% reporting medical use and 10% reporting non-medical use at the community clinic (hospital vs. community clinic: medical use, $p=0.01$; non-medical use, $p=0.4$). At the hospital clinic, prescription sedatives were reported by 18% and 7% of participants in the last year for medical and non-medical uses, respectively; prescription sedative use at the community clinic was approximately twice as high, with 43% of respondents reporting medical use and 12% reporting non-medical use of prescription sedatives in the last year (hospital vs. community clinic: medical use, $p<0.0001$; non-medical use, $p=0.2$). Erectile dysfunction medications were used medically by approximately 14% of men in the last year, and non-medically by 9%; erectile dysfunction medication use in the last year did not differ significantly between clinics (medical use, $p=0.1$; non-medical use, $p=0.4$). Use of stimulants was rare and similar in both sites (hospital vs. community clinic in the last 12 months: medical use, $p=0.4$; non-medical, $p=0.6$). Use of antipsychotic medications was rarely reported by participants at the hospital clinic but was much more frequent at the community clinic (1% vs. 18%, respectively, reported medical use in the last year; $p<0.0001$). Overall in the previous year, 27% of participants reported non-medical use of any prescription drug: 17% used one medication, 8% used two medications, and 2% used three or more medications.

Not surprisingly, the proportion of respondents endorsing either medical or non-medical use of each prescription medication category was substantially lower when asking about use in the last month, with only about half as many respondents reporting use in the last month compared to the proportion reporting use in the last year (Table 2). Overall in the past month, 14% of respondents reported non-medical use of at least one prescription

medication, with 9% using one medication, 4% using two medications, and less than 1% reporting non-medical use of three or more medications.

Overall, no demographic characteristic, including sex, age, race, sexual orientation, or education, was significantly associated with use of any prescription medication (including medical and non-medical use) in the previous year or month.

Other substance use

Most participants (75%) had used alcohol in the last year. Tobacco use (e.g., cigarettes, cigars and “swishers”) in the last year was also common, and differed by site (42% [hospital clinic] vs. 64% [community clinic]; $p=0.003$). Use of marijuana, ‘poppers’ (alkyl nitrites), methamphetamines and cocaine was reported more frequently than other illegal drugs. More than a third (37%) reported marijuana use in the last year, including 26% in the preceding month. Poppers were used by 21% of participants overall in the past year, and 15% in the last month (Table 2).

Comparison of drug use between clinics

Non-medical use of each prescription medication category in the last *year* was similar among the hospital and community clinic respondents. Non-medical use of each prescription medication in the last *month* was also similar among hospital and community clinic respondents, with the exception of sedatives, which were used more by community clinic respondents compared to the hospital clinic respondents (9% vs. 5%; $p=0.03$). Medical use of anxiety medications (12 months, $p=0.01$; 1 month, $p=0.0006$), sedatives (12 months, $p<0.0001$; 1 month, $p=0.001$), and antipsychotic medications (12 months, $p<0.0001$; 1 month, $p<0.0001$) were significantly higher in the community clinic compared to the hospital clinic in both time periods. The community clinic also had a significantly higher use of tobacco (12 months, $p=0.003$; 1 month, $p<0.0001$) and several illicit drugs in both the last year and month: marijuana (12 months, $p=0.02$; 1 month, $p=0.01$), methamphetamine (12 months, $p=0.02$; 1 month, $p=0.04$), cocaine (12 months, $p=0.02$), and MDMA (12 months, $p=0.02$; 1 month, $p=0.047$) (Table 2).

DISCUSSION

Among HIV-positive individuals recruited from an academic medical center and a community clinic, we found that beyond the expected high prevalence of use of ART (95%), use of other prescription medications by HIV-positive patients was very common, and use of prescription opioids in both participant populations approached 50%. In the US, sales of opioid pain relievers tripled from 1999 to 2010, from about 2 kg/10,000 people to 7 kg/10,000 people; coincident with this dramatic increase, the rate of opioid-related overdose deaths and treatment admissions almost quadrupled (CDC, 2011). In a nationally representative survey conducted from 2011–2012, 7% of US respondents aged 20 or older had used a prescription opioid in the previous month (Frenk, 2015). In contrast, we report that 24% of “in care” HIV-positive individuals had used prescription opioids (capturing both medical and non-medical use) in the previous month, more than triple the national average.

When the time period was expanded to the previous year, almost half of respondents had been exposed to opioid pain medications.

We found clinic-specific differences in drug and medication use. We suggest that the findings from the hospital clinic sample would be similar to other “in care” HIV-positive populations in the urban US, and the findings from the community clinic are generalizable to other community organizations which provide comprehensive medical, dental, and behavioral health services to HIV-positive individuals in and out of HIV-specific care. Our findings are similar to what has been observed in other studies, including some research from settings that could be considered higher-risk than this two-site sample. Prescription opioids treat pain, and in US studies, 39–85% of people living with HIV report pain (Merlin, 2014). In one study of indigent HIV-positive adults in California, 53% had received an opioid prescription in the prior 90 days (Jeevanjee, 2014). In a study of HIV-positive MSM, 14% endorsed recent non-medical use of prescription opioids (Kelly, 2010). We found that 14% of respondents reported non-medical use of at least one prescription medication in the prior month, and 27% in the previous year.

There are several potential clinical implications to these findings. First, as measured by self-report, almost all of the respondents to our survey were taking ART. Drug-drug interactions between ARTs and some prescription medications have previously been reported. In one study of healthy volunteers, co-administration of ritonavir/lopinavir almost tripled the plasma concentration of oral oxycodone (Nieminen, 2010). Based on this result, other ARTs taken concomitantly with ritonavir could similarly increase oxycodone concentration (Liverpool Drug Interactions Group, 2015). Second, prescription opioids are linked to subsequent heroin use. In one study, past non-medical use of prescription pain medication was associated with a 19-fold increase in initiation of heroin use. In the same report, nearly 80% of recent heroin initiates reported previous non-medical use of prescription pain relievers (Muhuri, 2013). Third, owing to similar chemical structures and mechanisms of action (e.g., μ -opioid receptor agonism) between prescription opioids (e.g., oxycodone) and illicit opioid drugs (e.g., heroin), prescription opioids may have similar adverse virological consequences as illicit opioid drugs. In one study of HIV-positive adults, non-medical use of prescription opioids was associated with significantly reduced ART adherence (Jeevanjee, 2014). Other provocative data suggest potential direct links between opioid use and HIV reactivation (Prottengeier, 2014). A very large, methodologically-rigorous study comparing HIV-positive and HIV-negative patients linked long-term opioid use with significantly increased mortality, including a 46% increase in HIV-positive patients versus only 25% increase in HIV-negative patients (Weisberg, 2015). These findings need further examination, but suggest that prescription opioids, like illicit opioids (reviewed in Banerjee, 2011), may accelerate HIV disease progression.

Although this study did not attempt to address the relationship between prescription opioid use and medication adherence, the use of non-prescription opioids such as heroin has been linked to adverse biomedical and behavioral outcomes in HIV-positive individuals, including poor antiretroviral therapy (ART) adherence (Azar 2015, Malta 2008). Recent cross-sectional research supports a parallel link between non-medical prescription opioid use and ART non-adherence: recent *non-medical* prescription opioid users had 47% increased odds

of self-reported ART non-adherence (Jeevanjee 2014). In contrast, in another study, those reporting recent *medical* use of prescription opioids had 39% decreased odds of self-reported ART non-adherence (Surratt 2015).

Our study had important limitations. First, as a cross-sectional survey, we cannot make inferences about the causes and consequences of prescription medication use. Some participants may have misreported their medication use out of stigma or embarrassment, although our design (self-administered and without collection of personal identifiers) was chosen to maximize participant privacy and confidentiality. We also did not ask about dose or frequency of use of any drug, including alcohol. Some participants may have completed the survey more than once, but because no compensation was provided, patients had little incentive to participate multiple times. By design, our findings are generalizable only to “in care” HIV-positive patients, whereas prescription medication use by “out-of-care” HIV patients may be different. We simplified the survey to ease completion by asking about *classes* of medication (e.g., opioids, stimulants) rather than specific medications. Although participants’ ability to answer questions correctly may have been limited by their understanding of medication classes, we tried to mitigate this weakness by giving specific examples of medication names. Finally, we did not test hair or urine specimens to validate self-reported drug use, although such samples are critical for future work that looks to link medication use to biological or behavioral outcomes.

Most respondents to our survey who indicated any prescription medication use reported that they used medications medically instead of non-medically. While this difference may be critical from a legal standpoint, the *effects* of these medications are likely to be independent of the characterization of their use as medical or non-medical. We suggest that the primary focus on non-medical use of prescription medications not only underestimates the widespread exposure of HIV-positive individuals to prescription drugs, but may also underestimate the behavioral and biological effects of use of prescription medications by this population. We also suggest that it would be prudent for HIV providers to regularly review their opioid prescription practices to make sure they are appropriate; this review could also help identify patients at risk for opioid dependence and those who may benefit from referral to a pain medicine specialist or addiction medicine specialist.

Acknowledgments

The authors are grateful for the participation of clinic attendees and staff. This research was supported in part by NIH awards AI090644 (JJK), R00HL108743 (NTF) and R56HL126563 (NTF), and by the SOLAR Foundation Research Fund at The Ohio State University (BMS). The content of this article is solely the responsibility of the authors, and it does not necessarily represent the official views of the funding agencies.

References

- Azar P, Wood E, Nguyen P, Luma M, Montaner J, Kerr T, Milloy MJ. Drug use patterns associated with risk of non-adherence to antiretroviral therapy among HIV-positive illicit drug users in a Canadian setting: a longitudinal analysis. *BMC Infect Dis.* 2015; 15:193. [PubMed: 25927573]
- Banerjee A, Strazza M, Wigdahl B, Pirrone V, Meucci O, Nonnemacher MR. Role of mu-opioids as cofactors in human immunodeficiency virus type 1 disease progression and neuropathogenesis. *J Neurovirol.* 2011; 17(4):291–302. [PubMed: 21735315]

- Benotsch EG, Martin AM, Koester S, Cejka A, Luckman D. Nonmedical use of prescription drugs and HIV risk behavior in gay and bisexual men. *Sexually Transmitted Diseases*. Jan 01; 2011 38(2): 105–10. [PubMed: 20838365]
- Boone MR, Cook SH, Wilson P. Substance Use and Sexual Risk Behavior in HIV-Positive Men Who Have Sex With Men: An Episode-Level Analysis. *Aids and Behavior*. Jun 01; 2013 17(5):1883–1887. [PubMed: 22392156]
- CDC Centers for Disease Control and Prevention. Vital signs: overdoses of prescription opioid pain relievers---United States, 1999–2008. *MMWR Morbidity and Mortality Weekly Report*. 2011; 60:1487–1492. [PubMed: 22048730]
- Carey JW, Mejia R, Bingham T, Ciesielski C, Gelaude D, Herbst JH, Sinunu M, ... Stall R. Drug use, high-risk sex behaviors, and increased risk for recent HIV infection among men who have sex with men in Chicago and Los Angeles. *Aids and Behavior*. Jan 01; 2009 13(6):1084–96. [PubMed: 18498049]
- Celentano DD, Latimore AD, Mehta SH. Variations in sexual risks in drug users: Emerging themes in a behavioral context. *Current Hiv/aids Reports*. Nov 01; 2008 5(4):212–218. [PubMed: 18838061]
- Colfax G, Shoptaw S. The methamphetamine epidemic: Implications for HIV prevention and treatment. *Current Hiv/aids Reports*. Dec 01; 2005 2(4):194–199. [PubMed: 16343378]
- Frenk SM, Porter KS, Paulozzi LJ. Prescription opioid analgesic use among adults: United States, 1999–2012. *NCHS Data Brief*. 2015:1–8.
- Hinkin CH, Barclay TR, Castellon SA, Levine AJ, Durvasula RS, Marion SD, Myers HF, ... Longshore D. Drug Use and Medication Adherence among HIV-1 Infected Individuals. *Aids and Behavior*. Mar 01; 2007 11(2):185–194. [PubMed: 16897351]
- Horvath KJ, Carrico AW, Simoni J, Boyer EW, Amico KR, Petroll AE. Engagement in HIV Medical Care and Technology Use among Stimulant-Using and Nonstimulant-Using Men who have Sex with Men. *Aids Research and Treatment*. Jan 01.2013 11:1–11.
- Jeevanjee S, Penko J, Guzman D, Miaskowski C, Bangsberg DR, Kushel MB. Opioid Analgesic Misuse is Associated with Incomplete Antiretroviral Adherence in a Cohort of HIV-Infected Indigent Adults in San Francisco. *Aids and Behavior*. Jul 01; 2014 18(7):1352–1358. [PubMed: 24077929]
- Johnston, LD.; O'Malley, PM.; Bachman..., JG. Monitoring the Future: National Survey Results on Drug Use, 1975–2009. Volume I: Secondary School Students. NIH: National Institute on Drug; 2010. p. 10-7584.
- Kapadia F, Vlahov D, Donahoe RM, Friedland G. The role of substance abuse in HIV disease progression: reconciling differences from laboratory and epidemiologic investigations. *Clinical Infectious Diseases : an Official Publication of the Infectious Diseases Society of America*. Jan 01; 2005 41(7):1027–34. [PubMed: 16142670]
- Kelly BC, Parsons JT. Prevalence and predictors of non-medical prescription drug use among men who have sex with men. *Addictive Behaviors*. Apr 01; 2010 35(4):312–317. [PubMed: 19944538]
- Liverpool Drug Interactions Group, University of Liverpool. Drug Interaction Charts. 2015. Retrieved from: www.hiv-druginteractions.org
- Malta M, Strathdee SA, Magnanini MM, Bastos FI. Adherence to antiretroviral therapy for human immunodeficiency virus/acquired immune deficiency syndrome among drug users: a systematic review. *Addiction*. 2008; 103(8):1242–57. [PubMed: 18855813]
- McCabe SE, Boyd CJ, Teter CJ. Subtypes of nonmedical prescription drug misuse. *Drug and Alcohol Dependence*. Jan 01.2009 102:1–3. [PubMed: 19332365]
- McCauley JL, Danielson CK, Amstadter AB, Ruggiero KJ, Resnick HS, Hanson RF, Smith DW, ... Kilpatrick DG. The role of traumatic event history in non-medical use of prescription drugs among a nationally representative sample of US adolescents. *Journal of Child Psychology and Psychiatry*. Jan 01; 2010 51(1):84–93. [PubMed: 19674194]
- Merlin JS, Walcott M, Ritchie C, Herbey I, Kertesz SG, Chamot E, Saag M, ... Turan JM. 'Two Pains Together': Patient Perspectives on Psychological Aspects of Chronic Pain while Living with HIV. *Plos One*. Nov 01.2014 9:11.

- Muhuri, PK.; Gfroerer, JC.; Davies, MC. Associations of nonmedical pain reliever use and initiation of heroin use in the United States. The Center for Behavioral Health Statistics and Quality; 2013. Data Review
- Nieminen TH, Hagelberg NM, Saari TI, Neuvonen M, Neuvonen PJ, Laine K, Olkkola KT. Oxycodone concentrations are greatly increased by the concomitant use of ritonavir or lopinavir/ritonavir. *European Journal of Clinical Pharmacology*. Jan 01; 2010 66(10):977–85. [PubMed: 20697700]
- Prottengeier J, Koutsilieri E, Scheller C. The effects of opioids on HIV reactivation in latently-infected T-lymphoblasts. *Aids Research and Therapy*. Jan 01.2014 :11. [PubMed: 24506969]
- Surratt HL, Kurtz SP, Levi-Minzi MA, Cicero TJ, Tsuyuki K, O'Grady CL. Pain treatment and antiretroviral medication adherence among vulnerable HIV-positive patients. *AIDS Patient Care STDS*. 2015; 29(4):186–92. [PubMed: 24984142]
- Vijayaraghavan M, Freitas D, Bangsberg DR, Miaskowski C, Kushel MB. Non-medical use of non-opioid psychotherapeutic medications in a community-based cohort of HIV-infected indigent adults. *Drug and Alcohol Dependence*. Jan 01.2014 143:263–7. [PubMed: 25107312]
- Weisberg DF, Gordon KS, Barry DT, Becker WC, Crystal S, Edelman EJ, Gaither J, ... Fiellin DA. Long-term Prescription of Opioids and/or Benzodiazepines and Mortality Among HIV-Infected and Uninfected Patients. *Aids Journal of Acquired Immune Deficiency Syndromes*. Jun 01; 2015 69(2):223–233. [PubMed: 26009831]

Table 1

Participant characteristics (n=254)

Participant characteristics	Total (n=254)		Hospital clinic (n=149)		Community clinic (n=105)		p-value ^b
	N	(%)	N	(%)	N	(%)	
Sex at birth							0.7
Male	230	(91)	134	(90)	96	(91)	
Female	24	(9)	15	(10)	9	(9)	
Age							0.01
18-24 years	10	(4)	1	(1)	9	(8)	
25-29 years	31	(12)	15	(10)	16	(15)	
30-39 years	59	(23)	34	(23)	25	(24)	
40-49 years	60	(24)	34	(23)	26	(25)	
50-59 years	76	(30)	51	(34)	25	(24)	
60 or older	18	(7)	14	(9)	4	(4)	
Race^a							-
White	175	(69)	107	(72)	68	(65)	
Black/African-American	70	(28)	36	(24)	34	(32)	
Native American	9	(4)	5	(3)	4	(4)	
Other	2	(1)	2	(1)	0	(0)	
Missing/refuse to answer	9	(4)	5	(3)	4	(4)	
Ethnicity							0.8
Hispanic	15	(6)	8	(5)	7	(7)	
Education							0.01
Less than high school	15	(6)	5	(3)	10	(9)	
12 th grade (finished high school/GED)	61	(24)	39	(26)	22	(21)	
Some college	93	(37)	46	(31)	47	(45)	
Finished college or higher	84	(33)	58	(39)	26	(25)	
Missing/Refuse to answer	1	(<1)	1	(1)	0	(0)	
Sexual orientation							0.8
Gay, lesbian or homosexual	172	(68)	99	(66)	73	(70)	
Bisexual	27	(11)	15	(10)	12	(11)	

Participant characteristics	Total (n=254)		Hospital clinic (n=149)		Community clinic (n=105)		p-value ^b
	N	(%)	N	(%)	N	(%)	
Heterosexual	38	(15)	25	(17)	13	(12)	
I don't use a term	9	(3)	6	(4)	3	(3)	
Missing/refuse to answer	8	(3)	4	(3)	4	(4)	
Currently taking ART					0.3		0.3
Yes	242	(95)	140	(94)	102	(97)	
No	6	(2)	3	(2)	3	(3)	
I don't know	4	(2)	4	(3)	0	(0)	
Missing/Refuse to answer	2	(1)	2	(0)	0	(0)	

^aSome participants self-reported more than 1 race, so categories total > 100

^bP-values comparing populations at Hospital clinic and Community clinic

Table 2

Use of prescription medications and other drugs, n=254

Prescription medications	Hospital clinic (n=149)						Community clinic (n=105)					
	Non-medical use			Medical use			Non-medical use			Medical use		
	Last 12 months	Last 1 month	N	(%)	N	(%)	Last 12 months	Last 1 month	N	(%)	N	(%)
Opitoid pain medications	16	(11)	8	(5)	63	(42)	31	(21)	13	(12)	5	(5)
Panic or anxiety medications	12	(8)	4	(3)	35	(23)	20	(13)	10	(10)	4	(4)
Sleep aids or sedatives	11	(7)	8	(5)	27	(18)	21	(14)	13	(12)	9	(9)
Erectile dysfunction medication *	12	(9)	7	(5)	21	(16)	13	(10)	9	(10)	4	(4)
Stimulants/ADHD medications	3	(2)	1	(1)	4	(3)	3	(2)	3	(3)	1	(1)
Antipsychotic medications	0	(0)	0	(0)	1	(1)	0	(0)	0	(0)	0	(0)
Antipsychotic medications	0	(0)	0	(0)	1	(1)	0	(0)	0	(0)	19	(18)
Antipsychotic medications	0	(0)	0	(0)	1	(1)	0	(0)	0	(0)	13	(12)
Other drugs												
Alcohol												
Alcohol	115	(77)	86	(58)	76	(72)	65	(62)	76	(72)	65	(62)
Tobacco												
Tobacco	63	(42)	51	(34)	67	(64)	62	(59)	67	(64)	62	(59)
Marijuana												
Marijuana	47	(32)	30	(20)	46	(44)	37	(35)	46	(44)	37	(35)
Poppers												
Poppers	30	(20)	20	(13)	24	(23)	17	(16)	24	(23)	17	(16)
Methamphetamine												
Methamphetamine	8	(5)	3	(2)	16	(15)	8	(8)	16	(15)	8	(8)
Cocaine												
Cocaine	8	(5)	5	(3)	16	(15)	6	(6)	16	(15)	6	(6)
Heroin												
Heroin	3	(2)	2	(1)	3	(3)	2	(2)	3	(3)	2	(2)
MDMA												
MDMA	1	(1)	0	(0)	6	(6)	4	(4)	6	(6)	4	(4)
'Bath salts'												
'Bath salts'	1	(1)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
Rohypnol												
Rohypnol	0	(0)	0	(0)	1	(1)	1	(1)	1	(1)	1	(1)
Mephedrone												
Mephedrone	0	(0)	0	(0)	1	(1)	1	(1)	1	(1)	1	(1)
GHB												
GHB	6	(4)	3	(2)	9	(9)	5	(5)	9	(9)	5	(5)
Ketamine												
Ketamine	2	(1)	1	(1)	2	(2)	2	(2)	2	(2)	2	(2)

* Denominator for erectile dysfunction medications is restricted to men only (Hospital Clinic, n=134; Community clinic, n=93)