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Current cigarette smoking among HIV-positive current and former drug users: associations with individual and social characteristics

Lauren R. Pacek[1,2,*], **Carl Latkin**[3], **Rosa M. Crum**[1,2,4], **Elizabeth A. Stuart**[2,5], and **Amy R. Knowlton**[3]

[1]Johns Hopkins School of Medicine, Department of Psychiatry and Behavioral Sciences, Baltimore, Maryland 21205

[2]Johns Hopkins Bloomberg School of Public Health, Department of Mental Health, Baltimore, Maryland 21205

[3]Johns Hopkins Bloomberg School of Public Health, Department of Health, Behavior & Society, Baltimore, Maryland 21205

[4]Johns Hopkins Bloomberg School of Public Health, Department of Epidemiology, Baltimore, Maryland 21205

[5]Johns Hopkins Bloomberg School of Public Health, Department of Biostatistics, Baltimore, Maryland 21205

Abstract

Cigarette smoking is endemic among HIV-positive populations and is related to substantial morbidity and mortality. Research has largely focused on individual-level characteristics associated with smoking, with less attention to social factors. We aimed to explore individual- and social-level characteristics associated with current cigarette smoking among people living with HIV. Data came from 358 individuals on antiretroviral therapy interviewed in a study on informal HIV caregiving, conducted in Baltimore, Maryland. Most participants (75%) were current smokers and 45% reported current illegal drug use. In adjusted logistic regression analyses, current drug use (aOR=2.90, 95% CI=1.58–5.30), 12-step program participation (aOR=1.74, 95% CI=1.02–2.97), and having a main Supporter who is a current smoker (aOR=1.93, 95% CI=1.12–3.33) were associated with current smoking. Findings suggest the importance of social-level factors in cigarette smoking among HIV seropositive drug users and have implications for developing targeted smoking cessation interventions for smokers living with HIV.

Keywords

cigarette smoking; HIV/AIDS; social environment; social support; informal caregiving

*Address correspondence to Lauren R. Pacek. Address: 5510 Nathan Shock Drive Behavioral Biology Research Center Room 1708, Baltimore, MD 21224. Phone: 724-889-3251, Fax: 410-550-0030, lpacek@jhmi.edu.

Introduction

Cigarette smoking is the leading preventable cause of death in the United States (US) [1]. While the prevalence of smoking among the general population is approximately 20% [2], the prevalence of smoking is estimated to be 40–70% among people living with HIV [3–8]. As life expectancies among people living with HIV continue to increase due to advancements in treatments for HIV, greater attention has been directed to the intersection of tobacco use and HIV. Along with increased life expectancies, an increased incidence of non-AIDS-related conditions has been observed in this population, many of which are associated with cigarette smoking [7–19] Furthermore, cigarette smoking among people living with HIV is associated with significant mortality. Authors of a population-based Danish cohort study concluded that smokers living with HIV lose more life-years to smoking than to HIV, and that the excess mortality of smokers is tripled and the population-attributable risk of death associated with smoking is doubled among patients with HIV as compared to population controls [20]. Additionally, some studies [21] have shown that cigarette smoking modifies CD4+ lymphocyte counts, though there have been inconsistencies in establishing a negative relation between smoking and the course of HIV [22]. Nonetheless, in a study among females on highly active antiretroviral therapy (HAART), evidence has suggested that cigarette smokers are more likely than non-smokers to have poorer HIV treatment outcomes [22, 23].

Although prior research has explored factors associated with cigarette smoking among HIV-positive populations, studies have largely been limited to the examination of individual-level characteristics (e.g., sex [5; 24], age [4; 25], race/ethnicity [4], education [4; 26], comorbid depression [24], heavy drinking [4], and illegal drug use [4, 6] are associated with current smoking among people living with HIV). Research examining the influence of dyadic-level (i.e., characteristics relating to interactions or relationships between two individuals) and family-level characteristics on current cigarette smoking among people with HIV has yet to be explored.

In the general population, smoking behaviors are consistently associated with social network factors [27]. Research among adolescent smokers has shown that the presence of smoking in an individual's network increases their risk of smoking [28] and is associated with an earlier age of smoking initiation [29] as compared to adolescents whose network does not contain smokers. Additionally, one study found nicotine dependence to be predicted, in part, by social-level factors (i.e., parental smoking status and peer smoking) [30]. Social factors also appear to play a role in smoking cessation. Social network analysis indicates that groups of interconnected individuals quit smoking in concert [27]. On a related note, one study found that the smoking status of an individual's partner was particularly influential; living with an ex-smoker, as compared to living with a never smoker, doubled the likelihood of quitting smoking, while those who live with a current smoker were the least likely to quit smoking [31]. Additionally, high levels of support from partners, as well as perceived availability of support are associated with cessation and short-term abstinence while, having social network members who were smokers was a hindrance to maintaining abstinence in the long-term [32]. It is likely that these social factors are also influential of smoking among people living

with HIV, given their previously observed association with smoking behaviors among the general population.

In light of the aforementioned gaps in the literature and the overwhelming need for smoking cessation interventions among people living with HIV due to the associated negative health sequelae, the objective of the present study was to examine social environmental factors and their association with current cigarette smoking among a sample of HIV-positive, urban, largely African American, current and former substance users. We hypothesized that individual-level characteristics such as current substance use, social environmental factors such as the presence of smoking and norms regarding smoking in the network would be associated with current cigarette smoking. The association of individual- and social-level factors with smoking may represent important targets for smoking cessation interventions.

Methods

Data Source

Data were from the 6-month follow-up assessment of the BEACON (BEing Active & CONnected) Study, a longitudinal study with three semi-annual visits aimed at examining social environmental influences on former and current drug users' HIV medication adherence and health outcomes. The study (2006–2012) was conducted in Baltimore, Maryland, US. The study enrolled two different types of participants: 1) Index participants (i.e., adults living with HIV who were current or former injection drug users and on antiretroviral therapy); and 2) up to two of Indexes' main supportive ties (i.e., Supporters) whom the Indexes authorized study recruitment, with recruitment selection priority based on degree of providing the Index emotional support and health-related instrumental assistance. For each Index with more than one Supporter enrolled, the main Supporter was selected for analysis based on degree of social support, and for ties, a rank hierarchy of main partner, female kin, male kin, and friend/other. Supporter eligibility included being an adult and providing informal (unpaid) support to the index; persons whose only relation to the Index was in a professional capacity were excluded. Index participants were recruited from the Johns Hopkins University Moore Clinic for HIV Care, the largest HIV care provider in Maryland, as well as via targeted street-outreach. Data were collected by trained interviewers and via audio computer-assisted self-interviewing (ACASI). Index and Supporter dyads were administered similar questionnaires. Information regarding the characteristics of Index and Supporter participants was self-reported by the Indexes and Supporters, respectively.

The survey for the 6-month follow-up visit contained more extensive information regarding cigarette smoking than either the baseline visit or 12-month follow-up visit. As a result, the present study utilized data from the 6-month follow-up visit. The sample for the present analysis comprised 358 Index participants (94% of the baseline sample). The Institutional Review Board at Johns Hopkins University Bloomberg School of Public Health approved this study.

Measures

Cigarette smoking variables (Index participants)—Index participants were asked whether they had smoked cigarettes in the past 30 days, and individuals reporting past 30 day smoking were considered to be current smokers. Current smokers were questioned about the number of cigarettes that they smoke per day (i.e., cigarettes per day (CPD): <1, 1–10, 11–20, 21+), how soon after waking they smoke their first cigarette of the day (i.e., time to first cigarette (TTFC): <5 minutes, 6–30 minutes, 31–60 minutes, and 60+ minutes), and lifetime use of nicotine replacement therapy (yes/no), and prior use of medications or pills for smoking cessation (yes/no).

Additionally, using the CPD and TTFC measures, we were able to create a variable for the Heaviness of Smoking Index (HSI) [33], a measure of nicotine dependence. Scores for the HSI range from 0 to 6, with higher scores indicating a higher level of probable dependence. As done in prior research [33], the HSI was categorized into a 3-category variable: low (0–1), medium (2–4), and high (5–6).

Individual-level variables (Index participants)

Sociodemographic variables: Sociodemographic variables selected for this analysis includes sex, age, race, past month income, and marital status. Age was categorized into approximate quartiles (28–44; 45–49; 50–53; 54–65). Race was dichotomized as "Black" or "non-Black" due to sample distribution. Past month income from all sources, including food stamps was dichotomized (<$500 versus >$500). Marital status was also dichotomized as "not married" or "married or in a committed relationship".

Drug and alcohol use: Individuals were dichotomized based on self-reported use of alcohol within the past month. Participants were also asked the following question for a variety substances (i.e., stimulants, opiates, tranquilizers or barbiturates, marijuana, heroin, cocaine or crack, hallucinogens, prescription drugs, and "other drugs"): "During the past 30 days, when you were using drugs, how often did you take [DRUG] to get high?" Participants that reported using any of these substances at least once within the past month were considered past-month users for that specific substance. A dichotomous composite variable was also created for "any past month drug use", not including alcohol. Additionally, individuals were dichotomized based on self-reported injection drug use in the past 6 months.

Depressive symptoms: The Center for Epidemiologic Studies Depression Scale (CES-D) is a short (20 item) self-report scale designed to measure depressive symptomatology in the general population [34]. The items of the scale correspond to symptoms that are associated with major depressive disorder, which have been used in previously validated longer scales. Possible range of scores is 0 to 60, with higher scores indicating the presence of more symptomatology. A score of 16 or higher has been used to identify individuals with clinically meaningful depressive symptoms [34].

HIV primary care visits & drug treatment utilization: Based on the distribution in exploratory analyses, the number of HIV primary care visits in the past 6 months was

categorized as approximate tertiles (0–2; 3–4; 5+). Utilization of 12-step programs was used as dichotomous variables (yes/no).

Dyadic-level variables (Supporter participants)—A dichotomous variable was created based on Supporters' responses to a question asking if they currently smoked. Not all participants had a main Supporter: 229 Index participants (64%) had a corresponding main Supporter. In order to utilize the full sample (n=358), the variable for Supporter smoking status was coded as "0" (i.e., "no") for individuals without partners or Supporters. This was deemed reasonable, since the Index participants without Supporters would not have had the smoking-related influence from Supporters at that point in their lives.

Family-level variables (Index participants)—Index participants were also asked several questions about their family members regarding the following topics. Questions were asked in the following way: "How many of your family [smoke cigarettes; encourage you to smoke; believe that smoking causes health problems; dislike smoking; have rules about where one can and cannot smoke within their home]?", with response options including "none", "some", "most", "all". Dichotomous variables were created ("none" versus "any") based on responses to the aforementioned questions.

Statistical Analysis

Chi-square (χ^2) tests were used to assess the statistical significance of relationships between current cigarette smoking status and individual-level, dyadic-level, and family-level variables. Unadjusted and adjusted logistic regression analyses were used to calculate odds ratios (ORs), adjusted odds ratios (aORs), and corresponding 95% confidence intervals (CI). Variable selection for the adjusted model was based on a combination of evidence from prior literature, *a priori* theory, and χ^2 p-values of <0.05. Variables selected for the adjusted model included: sex, age, marital status, income, past 30 day alcohol use, any past 30 day drug use, depressive symptoms, past 6 month participation in a 12-step program, family smoking, and main Supporter smoking. All analyses were performed using STATA SE statistical software version 12.0 [35].

Results

Index participant characteristics

Participant characteristics are shown in Table 1. Three-quarters (75%) of the sample reported current cigarette smoking. The majority of the sample were male (61.8%), Black (92.2%), reported a past month income of $500 or more (82.5%), and were not married (68.2%). More than a quarter of the sample was between the ages of 45–49 (27.3%), and the mean age was 48.9 years (SE=0.33). Approximately 38% of the sample had a CESD score of 16 or greater, indicating clinically meaningful depressive symptoms. In the past 6 months, 43.6% reported making 0–2 visits to their HIV primary care physician, 23.6% made 3–4 visits, and the remaining 32.9% reported making 5 or more visits. Additionally, 52.8% of participants reported engaging in a 12-step program in the past 6 months. A sizeable portion of the sample (37.9%) reported consuming alcohol in the past month, and the prevalence of alcohol use differed by current smoking status, with current smokers being more likely to

report alcohol use (χ^2 (1, $N = 358$) = 3.87, $p = 0.049$). Current smokers were also more likely than non-smokers to report any past month drug use (χ^2 (1, $N = 358$) = 15.98, $p < 0.001$) as well as past 6-month injection drug use (χ^2 (1, $N = 358$) = 5.16, $p = 0.023$).

Of the full sample, 46.4% had a Supporter who was a current smoker. Additionally, current cigarette smokers were more likely to have a main Supporter who was also a smoker than were non-smokers (χ^2 (1, $N = 358$) = 6.67, $p = 0.010$). A majority of the sample reported that at least some members of their family were current smokers (83.2%), and current smokers were more likely than non-smokers to have smokers in their family (85.5% vs. 76.4%, respectively) (χ^2 (1, $N = 358$) = 3.97, $p = 0.046$). Despite this, the majority of the sample reported that their family believed that smoking causes health problems (96.9%), dislikes cigarette smoke (89.4%), and has rules about smoking (87.4%). Few participants reported receiving encouragement from their family members to smoke (8.4%).

Smoking characteristics

Cigarette smoking characteristics are shown in Table 2. The majority of the current sample (75%) reported current cigarette smoking. Of the 269 current smokers, most (76%) reported smoking 1–10 cigarettes per day (CPD), and smoking their first cigarette of the day within 5 minutes of waking (34%). More than half (64%) of the current smokers exhibited a medium level of nicotine dependence, as assessed by the HSI. Fifty-eight percent of smokers reported previous experience with nicotine replacement therapy, and 8.6% reported previously using pills or medication for smoking cessation.

Drug use

Detailed information on drug use is shown in Table 3. Approximately 28% and 21% of the sample reported using cocaine/crack cocaine and heroin, respectively in the past 30 days; current smokers were significantly more likely to report either cocaine/crack cocaine use (χ^2 (1, $N = 358$) = 11.21, $p = 0.001$) and heroin use (χ^2 (1, $N = 358$) = 4.99, $p = 0.026$) than were non-smokers. Tranquilizers and/or barbiturates were used in the past 30 days by 4.5% of the sample, with smokers being more likely to report use (χ^2 (1, $N = 358$) = 5.54, $p = 0.019$). One-fifth (20.1%) of the sample reported past month use of marijuana and current smokers were significantly more likely to report marijuana use than were non-smokers (χ^2 (1, $N = 358$) = 7.37, $p = 0.007$).

Logistic regression analyses

After including all covariates in the multiple logistic regression model, several factors were found to be statistically significantly associated with cigarette smoking status (Table 4). Participation in a 12-step program was found to be significantly associated with current cigarette smoking (aOR=1.74, 95% CI=1.02–2.97). Additionally, any drug use in the past 30 days continued to be significantly associated with current smoking (aOR=2.90, 95% CI=1.58–5.30) in the adjusted model. Among dyadic-level characteristics assessed, having a main Supporter who smokes also continued to be associated with current cigarette smoking (aOR=1.93, 95% CI=1.12–3.33) in the final multiple logistic regression model.

Supporter characteristics

In light of our findings, we explored characteristics of Supporter individuals (Table 5). The majority of Supporters were female (58.1%) and the mean age was 47.8 years (SE=0.73). The majority of Supporters were Black (92.6%), had a past month income of $500 or greater (74.1%), and approximately half were married (47.2%) and had HIV (46.6%). Approximately 41% of Supporters live with their Index. In terms of type of relationship to their Index participant, 43.2% of Supporters were their Index's partner, 27.1% were kin, and 29.3% were of some "other" relationship (i.e., friend, neighbor, etc.) to their Index. Furthermore, 35.8% of Supporter-Index relationships were same sex dyads (i.e., male Supporter, male Index), and the remaining 64.2% were opposite sex dyads (i.e., male Supporter, female Index). Approximately half (48.5%) of Supporters reported using alcohol in the past month, and 40.8% reported past month drug use. In exploratory analyses to assess associations between Supporter characteristics and Index current smoking status, none of the associations were statistically significant.

Discussion

Findings from the present study identified several characteristics, both individual and social environmental, that are associated with current cigarette smoking in adjusted models among a sample of individuals living with HIV. In terms of individual-level characteristics, past month illegal drug use was strongly associated with current cigarette smoking among this sample of persons living with HIV. This finding is consistent with prior research conducted in both HIV-positive [4; 6] and general populations [36]. Additionally, individuals reporting participation in 12-step program within the past 6 months were significantly more likely than those not engaging in such programs to be current smokers. One potential explanation for this finding is that within some treatment communities, major life changes during the early portions of the recovery process are discouraged for fear of triggering relapse, and the treatment culture has accepted that quitting tobacco use would constitute a major life change [37,38]. Additionally, in some treatment organizations, smoking is a part of the staff culture, where staff members take smoking breaks with one another, and sometimes even with their clients [39]. Interestingly, a sizeable proportion of the sample reported engaging in recent contact with an HIV care provider or a 12-step program; each of these interactions with healthcare professionals represents a unique opportunity to address smoking cessation.

A novel finding in the present analyses included the observed association between main Supporter cigarette smoking status and current smoking of Index participants. Smoking by a main Supporter was associated with a nearly two-fold increased odds of current smoking relative to Index participants whose Supporter was a non-smoker. It is worth noting that some Supporters fulfill multiple roles within Indexes' lives: approximately 43% of main Supporters were also their respective Index participant's main partner, 27% were kin/family, and 29% fulfill some other role (mostly friends). Given findings from the general population in which social environmental are associated with smoking behaviors (e.g., work by Monden and colleagues [31]), in which a partner's smoking status is associated with smoking cessation), and that Supporters' smoking status is associated with Indexes' smoking status in

the present work, the Supporter/partner-Index participant relationship may present an important potential point for implementing smoking cessation interventions.

The present study has several limitations that should be acknowledged. For instance, this study utilizes cross-sectional data; therefore temporal relationships between variables cannot be clearly determined. Also, generalizability of the findings may be limited due to the unique nature of the population. Additionally, all data were collected via self-report, which carries the inherent possibility for social desirability bias. In attempt to mitigate this possibility, data were collected using audio computer-assisted self-interviewing (ACASI), which has been shown to improve the likelihood of valid reporting of sensitive information [40]. Furthermore, the survey did not contain sociometric social network data (i.e., data in which the entire community, or as many as possible, are interviewed, and all respondents are asked about their contacts within the community) [41]. With sociometric data, one might be able to obtain additional information, including the density of smoking in the network, the role relationship of smokers, and the specific support provided by smokers. Also, our definition of "current smoking" (i.e., having smoked within the past 30 days) is not optimal; we were limited by questions included in the survey (i.e., lack of information on past smoking behaviors, number of lifetime cigarettes smoked, etc.) in our ability to define current smoking.

Notwithstanding these limitations, the study has several strengths as well. Results from this study contribute to the extant literature concerning factors that are associated with cigarette smoking among individuals with HIV—a population exhibiting an unduly high prevalence of cigarette smoking and, consequently, bearing a disproportionate burden of smoking-related morbidity—by investigating social environmental variables associated with smoking. Additionally, this study focuses on and provides information on a prevalent and typically hard-to-reach population.

Additional research concerning social-level factors and cigarette smoking behaviors is warranted. For instance, future work could attempt to elucidate how Supporters may mediate the relationship between smoking and smoking cessation among people living with HIV. Future research should explore Index-Supporter interactions and aspects of the relationship relevant to smoking and dyadic approaches to smoking cessation intervention. In relation to the present work, the future could involve the development, and subsequent evaluation of effectiveness, of smoking cessation interventions with a social component. Such interventions could be conducted as social components of traditional smoking cessation approaches or as stand-alone interventions.

In summary, this study confirms prior research indicating that cigarette smoking is highly prevalent among HIV-positive populations, and corroborates previous research findings showing that individual-level factors, such as recent illicit drug use, are associated with cigarette smoking among HIV-positive persons. Findings from this study also extend existing research by demonstrating that social factors, specifically that a main Supporting individual's smoking behavior is associated with an Index participant's current smoking status. These findings are significant in that they contribute to an increased understanding of the factors that are related to smoking among a high-risk population. Findings from this

work also have the potential to direct and inform future research concerning social-level factors and cigarette smoking among people living with HIV. Furthermore, findings have potential implications for the development of smoking cessation treatment interventions. Given the high prevalence of smoking among persons with HIV, it may be prudent to integrate smoking cessation efforts with HIV primary care settings. Findings from this study also emphasize that members of an individual's social network may strongly influence their smoking behaviors. Smoking cessation interventions with a social component, namely ones that involve main Supporter individuals, may prove to be effective, and should be explored in future investigations.

Acknowledgments

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Table 1

Characteristics of HIV-positive current or former injection drug users, stratified by smoking status (BEACON study, Baltimore, MD, 2006–2012; n=358)

| | Total Sample (n = 358) | Current smoking | | |
| | | No (n=89) | Yes (n=269) | p-value |
		n (%)	n (%)	
Characteristic				
Individual-Level				
Sex				
Male	222 (61.8)	59 (66.3)	163 (60.6)	0.337
Female	137 (38.2)	30 (33.7)	106 (39.4)	
Age				
28–44	87 (24.2)	20 (22.5)	66 (24.5)	0.239
45–49	98 (27.3)	23 (25.8)	75 (27.9)	
50–53	89 (24.8)	18 (20.2)	71 (26.4)	
54+	85 (23.7)	28 (31.5)	57 (21.2)	
Age (Mean (SE))	48.9 (0.33)	49.5 (0.70)	48.6 (0.37)	0.240
Race				
Black	330 (92.2)	86 (96.6)	244 (90.7)	0.071
Non-black	28 (7.8)	3 (3.4)	25 (9.3)	
Income				
<$500	64 (17.5)	13 (14.6)	51 (19.0)	0.353
$500+	302 (82.5)	76 (85.4)	218 (81.0)	
Marital status				
Not married	244 (68.2)	60 (67.4)	184 (68.4)	0.863
Married/committed relationship	114 (31.8)	29 (32.6)	85 (31.6)	
CESD Score				
<16	223 (62.3)	60 (67.4)	163 (60.6)	0.250
16+	135 (37.7)	29 (32.6)	106 (39.4)	
HIV Primary Care Visits				
0–2	156 (43.6)	42 (47.2)	114 (42.4)	0.641
3–4	84 (23.6)	18 (20.2)	66 (24.5)	
5+	118 (32.9)	29 (32.6)	89 (33.1)	
12-Step Program (yes)	189 (52.8)	40 (44.9)	149 (55.4)	0.087
Alcohol (yes)	136 (37.9)	26 (29.2)	110 (40.9)	0.049
Any drug use (yes)	162 (45.1)	24 (27.0)	138 (51.3)	<0.001
Injection drug use (yes)	65 (18.1)	9 (10.1)	56 (20.8)	0.023
Dyadic-Level				
Main Supporter smokes (yes)	170 (46.4)	30 (33.7)	133 (49.44)	0.010
Family-Level				
Smokers in family (yes)	298 (83.2)	68 (76.4)	230 (85.5)	0.046

	Total Sample (n = 358)	Current smoking		
		No (n=89)	Yes (n=269)	p-value
		n (%)	n (%)	
Encouragement to smoke by family (yes)	30 (8.4)	6 (6.7)	24 (8.9)	0.520
Smoking causes health problems[a] (yes)	345 (96.9)	84 (95.4)	261 (97.4)	0.363
Family dislikes smoking (yes)	320 (89.4)	80 (89.9)	240 (89.2)	0.859
Family has rules about smoking[b] (yes)	313 (87.4)	79 (88.8)	234 (87.0)	0.661

[a]Belief held by family/friends

[b]Rules about where people can and cannot smoke in the home

Table 2

Cigarette smoking characteristics of HIV-positive current cigarette smokers (BEACON study, Baltimore, MD, 2006–2012; n=269)

Smoking characteristics	n	%
CPD[a]		
<1	2	0.7
1–10	203	75.8
11–20	60	22.4
21–30	1	0.4
31+	2	0.7
Time to first cigarette		
<5 minutes	91	34.0
6–30 minutes	81	30.2
31–60 minutes	25	9.3
60+ minute	71	26.5
HSI[b]		
Low	93	34.7
Medium	172	64.2
High	3	1.1
Previous cessation attempts & methods		
Nicotine replacement[c]		
No	114	42.4
Yes	155	57.6
Pills/medications[d]		
No	246	91.4
Yes	23	8.6

[a]CPD = cigarettes per day

[b]HSI = Heaviness of Smoking Index

[c]Includes products like gum, Nicorette, patches, inhalers, and lozenges

[d]Includes products like Zyban, Wellbutrin, and Chantix (Bupropion or Varenicline)

Table 3

Drug and alcohol use characteristics of HIV-positive current or former injection drug users (BEACON study, Baltimore, MD, 2006–2012; n=358)

Past 30 Day Drug and Alcohol Use	Total sample (n=358)	Non-Smokers (n=89)	Smokers (n=269)	p-value
Alcohol	136 (37.9)	26 (29.2)	110 (40.9)	0.049
Cocaine/crack cocaine	102 (28.5)	13 (14.6)	89 (33.1)	0.001
Heroin	74 (20.7)	11 (12.4)	63 (23.4)	0.026
Stimulants[a]	3 (0.8)	0 (0.0)	3 (1.1)	0.317
Opiates[b]	47 (13.1)	8 (9.0)	39 (14.5)	0.182
Tranquilizers/barbiturates	16 (4.5)	0 (0.0)	16 (5.9)	0.019
Marijuana	72 (20.1)	9 (10.1)	63 (23.4)	0.007
Hallucinogens	1 (0.3)	0 (0.0)	1 (0.4)	0.565
Prescription drugs	12 (3.3)	2 (2.2)	10 (3.7)	0.504
Other	3 (0.8)	0 (0.0)	3 (1.1)	0.317
Any drug use[c]	162 (45.2)	24 (27.0)	138 (51.3)	<0.001

[a]Other than cocaine/crack cocaine

[b]Other than heroin

[c]Not including alcohol

Table 4

Unadjusted and adjusted odds ratios to assess the association of characteristics with current cigarette smoking among a sample of HIV-positive current or former injection drug users (BEACON study, Baltimore, MD, 2006–2012; n=358)

Characteristics	OR[a] (95% CI[b])	aOR[c,d] (95% CI)
Individual-Level		
Sex		
Male	1.0	1.0
Female	1.28 (0.77–2.11)	1.48 (0.85–2.59)
Age		
28–44	1.0	1.0
45–49	0.99 (0.50–1.96)	1.22 (0.58–2.56)
50–53	1.19 (0.58–2.45)	1.61 (0.73–3.55)
54–65	0.62 (0.31–1.21)	1.05 (0.49–2.45)
Race		
Black	1.0	1.0
Non-black	2.84 (0.86–9.97)	2.95 (0.83–10.53)
Income		
<$500	1.0	1.0
$500+	0.73 (0.38–1.42)	0.81 (0.40–1.65)
Marital status		
Not married	1.0	1.0
Married/committed relationship	0.96 (0.57–1.59)	0.85 (0.48–1.51)
CESD Score		
<16	1.0	1.0
16+	1.35 (0.81–2.23)	1.11 (0.64–1.93)
12-Step Program (yes)	1.52 (0.94–2.46)	**1.74 (1.02–2.97)**
Alcohol (yes)	**1.68 (1.00–2.81)**	1.23 (0.70–2.33)
Any drug use (yes)	**2.85 (1.69–4.83)**	**2.90 (1.58–5.30)**
Dyadic-Level		
Main supporter smokes (yes)	**1.92 (1.17–3.17)**	**1.93 (1.12–3.33)**
Family-Level		
Smokers in family (yes)	**1.82 (1.00–3.30)**	1.21 (0.62–2.36)

[a]OR = odds ratio

[b]CI = confidence interval

[c]aOR = adjusted odds ratio

[d]Adjusted for sex, age, race, marital status, income, past 30 day alcohol use, any past 30 day drug use, depression, 12-step program participation, family smoking, main supporter smoking

Table 5

Characteristics of main Supporter of HIV-positive current or former injection drug users (BEACON study, Baltimore, MD, 2006–2012; n=229)

Characteristic	N (%)
Sex	
Male	96 (41.9)
Female	133 (58.1)
Age (Mean (SE[a]))	47.8 (0.73)
Race	
Black	212 (92.6)
Non-black	17 (7.4)
Marital status	
Not married	121 (52.8)
Married/In a committed relationship	108 (47.2)
Income	
<$500	59 (25.9)
$500+	169 (74.1)
Supporter has HIV	
No	110 (53.4)
Yes	96 (46.6)
Supporter lives with Index	
No	134 (58.5)
Yes	95 (41.5)
Dyad type	
Same-sex	82 (35.8)
Opposite-sex	147 (64.2)
Relationship of Supporter to Index	
Partner	99 (43.2)
Kin	62 (27.1)
Friend/other	68 (29.3)
Alcohol use (30 day)	
No	118 (51.5)
Yes	111 (48.5)
Any illegal drug use (30 day)	
No	135 (59.2)
Yes	93 (40.8)

[a]SE = standard error