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Substance Use and the Quality of Patient-Provider Communication in HIV Clinics

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Abstract

The objective of this study was to estimate the influence of substance use on the quality of patient-provider communication during HIV clinic encounters. Patients were surveyed about unhealthy alcohol and illicit drug use and rated provider communication quality. Audio-recorded encounters were coded for specific communication behaviors. Patients with vs. without unhealthy alcohol use

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rated the quality of their provider's communication lower; illicit drug user ratings were comparable to nonusers. Visit length was shorter, with fewer activating/engaging and psychosocial counseling statements for those with vs. without unhealthy alcohol use. Providers and patients exhibited favorable communication behaviors in encounters with illicit drug users vs. non-users, demonstrating greater evidence of patient-provider engagement. The quality of patient-provider communication was worse for HIV-infected patients with unhealthy alcohol use but similar or better for illicit drug users compared with non-users. Interventions should be developed that encourage providers to actively engage patients with unhealthy alcohol use.

Keywords

Alcoholism; Substance-related disorders; Communication; HIV; Quality of health care; Patient satisfaction

Introduction

Over half of HIV-infected Americans report a history of substance use [1,2]. The combination of HIV infection and substance use represents a dual disadvantage. In addition to negative outcomes related to substance use per se, HIV-infected patients using illicit drugs experience worse HIV-related outcomes, including lower rates of antiretroviral (ARV) treatment [3,4], more HIV-related symptoms [5] and higher hospitalization rates [6].

Effective patient-provider communication has the potential to address these outcome disparities by engaging substance users in addiction treatment [2] that, in turn, improves HIV treatment adherence and outcomes. Substance use treatment is associated with improved ARV adherence [7], decreased emergency department visits and hospitalizations [8], and increased receipt of primary care [9]. Yet, substance use treatment is underutilized among HIV-infected persons [2,10–12], with only one in five current users reporting substance use discussions with their HIV care provider in the prior 6 months [2]. Patient-provider communication is associated with enrollment in substance abuse treatment. In a survey of patients attending HIV Research Network clinics, patient-provider discussions of substance use were strongly associated with receipt of substance abuse treatment [2]. Patient gender [13], race/ethnicity [14–16], health status [17], age [18] socioeconomic status [19], and provider gender [13] can all affect the style and quality of patient-provider communication, yet little empiric data exists regarding how patient substance use affects communication style.

Primary care providers are accustomed to managing chronic relapsing conditions such as substance use disorders, and are well positioned to engage patients in substance abuse treatment [20], improve linkages between addiction treatment and medical care [21], and facilitate relapse prevention [22,23]. Building rapport through effective patient-provider communication is key to improving outcomes related to both substance use and HIV infection. Surveys of HIV-infected patients suggest that their ratings of engagement with health care providers [24], strength of relationship with their HIV provider [25], and perception that their provider “knows them as a person” [26] are associated with improved ARV adherence and outcomes. Little is known, however, about how past or ongoing substance use affects patient-provider communication in HIV clinic settings.

The objective of this study was to estimate the influence of patient illicit drug and unhealthy alcohol use on the quality of patient-provider communication during HIV clinic encounters, using both patient ratings of communication quality and direct observations of patient-provider communication. We hypothesized that the quality of patient-provider

communication would be lower in patients with current substance use compared with those with past or no history of substance use.

Methods

Study Sample and Setting

The Enhancing Communication and HIV Outcomes (ECHO) Study is an observational study designed to assess the quality of communication between health care providers and HIV-infected patients in ambulatory clinical settings. Subjects were primary care providers and their patients at four outpatient HIV care sites (Baltimore, Detroit, New York, and Portland, OR) participating in the HIV Research Network [27]. The study received Institutional Review Board approval from each site. Eligible providers were physicians, nurse practitioners, or physician assistants who provided primary care to HIV-infected patients. Eligible patients were HIV-infected, 19 years or older, English-speaking, and had at least one prior visit with their provider.

Data Collection Methods

HIV providers who agreed to participate gave informed consent and completed a baseline questionnaire. Research assistants approached patients of participating providers in clinic waiting rooms, with the goal of enrolling ten patients per provider. Eligible patients gave informed consent, and then research assistants placed a digital audio-recording device in the examination room to record the patient-provider encounter. Following the medical encounter, research assistants administered a one-hour interview with patients, assessing demographic and behavioral characteristics, as well as their experience of care and ratings of provider communication. Finally, research assistants abstracted clinical data including most recent CD4 counts and HIV viral loads from patients' medical records.

Measures

Substance Use—The independent variables for this analysis were unhealthy alcohol and illicit drug use, as elicited in the interview following the medical encounter. We used items from the Addiction Severity Index (ASI)-lite to ask patients to identify current, former, or no past unhealthy alcohol or illicit drug use [28]. The ASI has been extensively validated [29,30] and has good test-retest reliability over time [31]. It has been used to detect problematic alcohol and illicit drug use in vulnerable populations including severely mentally ill [32], homeless [33], and minority racial/ethnic populations [34]. Specifically, patients were asked, “How many days in the past 30 days have you used (alcohol to intoxication, or name of drug)?” and, “How many years in your life have you regularly used (alcohol to intoxication, or name of drug)? Regular use means 3 or more times per week, binges, problematic irregular use in which normal activities are compromised.” Current unhealthy alcohol use was any drinking to intoxication in the past 30 days. Former unhealthy alcohol use was no unhealthy use in the past 30 days and prior regular problematic alcohol use three or more times per week, binges, or problematic irregular use in which normal activities were compromised. Individuals who did not meet criteria for current or former alcohol use were categorized as no unhealthy alcohol use. For illicit drug use, we defined current use as any use of heroin or cocaine, or use of amphetamines, methadone, opiate analgesics, or marijuana without a prescription in the past 30 days. Former illicit drug use was no illicit drug use in the past 30 days and prior regular illicit drug use three or more times per week, binges, or problematic irregular use in which normal activities were compromised. Individuals who did not meet criteria for current or former illicit drug use were categorized as no illicit drug use.

Patient-Provider Communication—Our dependent variables were measures of patient-provider communication derived from two sources: (1) audio-recorded communication behaviors and (2) patients' post-visit ratings of provider communication.

Communication Behaviors—Audiotapes were analyzed using the Roter Interaction Analysis System (RIAS), a coding system to assess patient and provider communication behaviors during medical encounters with well-documented reliability and predictive validity [35–37]. RIAS analysts assign one of 37 mutually exclusive and exhaustive categories to each complete thought expressed by either the patient or provider (referred to as an utterance). These categories can be combined to reflect broad types of exchange for provider and patient utterances: positive talk (e.g., compliment) vs. negative talk (e.g., direct criticism), information-giving (e.g., test results) vs. question-asking (e.g., any question), biomedical talk (e.g., statements about disease processes) vs. psychosocial/lifestyle counseling talk (e.g., statements about mental health or sexual behaviors), and patient engagement/activation (e.g., asking for the others' opinions, confirming the others' understanding, or clarifying one's own understanding) [35]. In addition, we assessed the overall RIAS communication measures of verbal dominance (the ratio of provider to patient utterances) and visit length (total communication dialogue time in minutes). All coding was performed by two experienced RIAS coders who had no knowledge of the patients' self-reported substance use. The overall inter-coder reliability, calculated on a 10% random sample of 41 audio-recordings, was 0.71–0.95 across categories for patient and provider behaviors.

Patient-Rated Communication Quality—In post-visit interviews, patients were asked to report on the quality of their provider's overall communication (20 items, Cronbach's alpha 0.87) [38], HIV-specific communication (four items, Cronbach's alpha 0.91) [25], and adherence-specific communication (three items, Cronbach's alpha 0.90) [25]. We assessed overall satisfaction with care by asking patients to rate the overall quality of medical care they received in the past 6 months (one item) [39]. Because of skewed response distributions, we divided responses for our overall and HIV-specific communication scales into tertiles and defined optimal quality as the highest tertile. For adherence-specific communication and overall patient satisfaction, we defined optimal quality as the highest response vs. less than the highest response due to limited response variability.

Covariates—Covariates included patient self-reported gender (female, male), race/ethnicity (White, African-American, Latino, Other), age in years, education level (<high school vs. ≥ high school), antiretroviral therapy (yes/no), CD4 count (cells/ml³), and depressive symptoms using the 10-item Center for Epidemiologic Studies depression scale (CES-D), with scores divided into tertiles (lowest, middle, highest level of depression) [40]. We chose to use CES-D score tertiles instead of clinical cutoffs because, (a) we wished to assess potential dose–response relationships between depression and communication behaviors, (b) the CESD score was positively skewed in our data, and (c) it has suboptimal specificity for diagnosing depression [41]. Provider-level covariates included gender, provider-rated clinic busyness on day of encounter (“very busy” vs. less than “very busy”), and duration of patient-provider relationship (<vs. ≥ 5 years). We considered study site as a covariate as well.

Analysis—We assessed bivariate and multivariate associations between unhealthy alcohol or illicit drug use and RIAS-measured communication behaviors with linear regression for visit length and verbal dominance, and Poisson regression for specific patient and provider communication behaviors (corrected for over-dispersion of variance). We assessed bivariate and multivariate associations between unhealthy alcohol or illicit drug use and patient-rated

optimal communication quality and satisfaction with logistic regression. For all regression analyses, we used generalized estimating equations to account for clustering of patients within provider. Patient and provider covariates were included in multivariate regression models if significantly associated with dependent variables in bivariate analyses ($P < 0.20$), or on the basis of *a priori* hypotheses. Potential interactions between substance use and covariates were assessed. The Wald X^2 test was used to assess the overall significance of interaction terms in multivariate regression models. We conducted several sensitivity analyses to assess the effect of using alternative measures of substance use including, (a) number of days drinking alcohol to intoxication in past 30 days, (b) current polysubstance use (number of different substances used in the past 30 days, including alcohol), (c) a drug use measure that excluded marijuana (current, former, never), and (d) an adaptation of a weighted drug use severity index which assigns a score of 1 for marijuana or analgesics, 2 for other drugs besides cocaine and heroin, 3 for cocaine and heroin, and sums the scores (possible range 0–16) [42,43]. We considered each of these measures as alternatives to current, former, never unhealthy alcohol or illicit drug use in models estimating associations between substance use and communication behaviors and patient-rated communication quality. All analyses were conducted using Stata/IC version 11.0 (StataCorp, College Station, Texas).

Results

Participants

Of 55 eligible providers across all sites, 45 (82%) agreed to participate. Only two providers refused (one due to discomfort with audio-recording and the other due to time constraints). The remainder of providers who were not enrolled were not pursued because we reached enrollment targets. Providers had a mean patient panel size of 123 patients, and we enrolled a mean of ten patients per provider. Therefore, these patients represent an 8% convenience sample of each provider's patients. Providers were predominately female and approximately one-third reported they had known the enrolled patient for 5 or more years and rated the day of the clinic encounter as "very busy" (Table 1).

Across all sites, we identified 617 eligible patients. Providers refused to allow 18 patients to be approached for the study. Reasons for provider refusal included that the provider felt too rushed ($n = 12$), that the patient may be too sick ($n = 5$) and that the patient was only returning for labs rather than a complete visit ($n = 1$). Of the remaining 599 patients approached, 434 (72%) agreed to participate and completed all study procedures. Of the 165 patients who declined to enroll in the study, the most common reasons were that they didn't have time to complete the interview ($n = 106$), that they weren't feeling well ($n = 22$), and that they weren't interested in research studies ($n = 13$). All participants completed written informed consent. Patients received \$50 at completion of participation. Seventeen audio-recordings were unsuitable for analysis due to recorder malfunction and an additional four patients were missing substance use data, leaving 413 patient encounters available for substance use communication analysis. Patient participants were predominantly male, African-American, and had completed at least a high school education (Table 1). Self-reported current unhealthy alcohol (10%) and illicit drug use (28%) were common, and 23 individuals (6%) reported currently using both.

Association Between Substance Use and Communication Behaviors

Table 2 reports associations between unhealthy alcohol use and communication behaviors. Providers spent less time talking with patients reporting current (22.2 min, $P = 0.02$) and former (22.9 min, $P = 0.007$) compared with no history of unhealthy drinking (26.9 min). They made fewer patient engagement/activating statements with both former (Incident Rate

Ratio [IRR] 0.88, 95% confidence interval [CI] 0.77, 0.99) and current (IRR 0.81, 95% CI 0.66, 1.00) unhealthy drinkers compared with those with no history of unhealthy drinking. Providers also made fewer psychosocial/lifestyle counseling statements during clinical encounters with current unhealthy drinkers (IRR 0.60, 95% CI 0.43, 0.82). Patients with current unhealthy alcohol use also made fewer engagement/activation (IRR 0.68, 95% CI 0.47, 0.98) and positive statements (IRR 0.77, 95% CI 0.63, 0.94) to their providers, compared with those with no history of unhealthy drinking.

In speaking to patients with current illicit drug use (Table 3), providers made more negative statements (IRR 1.77, 95% CI 1.22, 2.58) and asked more questions (IRR 1.14, 95% CI 1.00, 1.30) compared to those with no history of illicit drug use. Current illicit drug users also made more negative (IRR 2.04, 95% CI 1.34, 3.10), information-giving (IRR 1.25, 95% CI 1.08, 1.44), engagement/activation (IRR 1.36, 95% CI 1.07, 1.73), biomedical (IRR 1.20, 95% CI 1.02, 1.41), and psychosocial/lifestyle (IRR 1.30, 95% CI 1.04, 1.62) statements to their provider compared with never-users.

Association Between Substance Use and Patient-Rated Communication Quality

Table 4 presents associations between substance use and patient ratings of their provider's communication quality and satisfaction with the overall quality of their care. Patients with current unhealthy alcohol use were less satisfied with the overall quality of their medical care (adjusted odds ratio [aOR] 0.36, 95% CI 0.15, 0.84) and rated the overall quality of their provider's communication (aOR 0.24, 95% CI 0.09, 0.66) and HIV-specific communication (aOR 0.31, 95% CI 0.11, 0.89) much lower than did those with no history of unhealthy alcohol use. In contrast to alcohol use, and despite several key differences in specific communication behaviors, no differences in patient-rated satisfaction or communication quality were observed for those with current or former illicit drug use, compared to non-users.

Interaction Between Substance Use and Depression and Sensitivity Analysis

Interaction analysis revealed that the association between current unhealthy alcohol and psychosocial counseling statements was modified by depression. Current and former drinkers with higher levels of depression received less psychosocial counseling than those with lower levels of depression (Fig. 1; Wald χ^2 (df = 4) = 13.9, P = 0.008 for overall interaction term), whereas no such interactions were identified among illicit drug users (Wald χ^2 (df = 4) = 3.99, P = 0.408 for overall interaction term). No interactions were identified between substance use and other patient characteristics for other communication behaviors or patient-rated communication quality. Sensitivity analyses using alternative measures of alcohol and drug use including (a) frequency of drinking alcohol to intoxication, (b) current polysubstance use, (c) a drug use measure that excluded marijuana, and (d) a weighted drug use severity measure did not substantially change the results of any analysis.

Discussion

Our study suggests that the quality of both patient-rated and directly observed patient-provider communication differs for HIV-infected patients with substance use, such that communication patterns are worse for HIV-infected patients with current unhealthy alcohol use, and either the same or even better for those with active illicit drug use. We found that patients with unhealthy alcohol use spend less time talking with their providers, received fewer engaging/activating and psychosocial counseling statements from their providers and rated the quality of communication lower than those without unhealthy alcohol use. In contrast, patients with current illicit drug use gave and received more psychosocial/lifestyle

counseling statements to and from their providers and rated the quality of communication no differently than non-users. Improving patient-provider communication is an overlooked, but important aspect of improving quality of care for HIV-infected patients with substance use, and may particularly benefit those with unhealthy alcohol use.

Our data suggests that both provider and patient behaviors may contribute to suboptimal communication among current unhealthy drinkers in HIV care. This gap in the quality of patient-provider communication is important because effective patient-provider communication is associated with improved antiretroviral adherence and outcomes. Bakken et al. reported a positive association between patient engagement with health care provider and adherence [24]. Schneider et al. reported that patient ratings of their relationship with their HIV provider are highly correlated with their self-reported adherence to therapy [25]. Beach and colleagues found that patients' perception of being "known as a person" [26,35] is significantly and independently associated with receiving ART, adhering to ART, and having undetectable serum HIV RNA. Our findings generate a new hypothesis that provider unconscious bias may contribute to differences in communication behavior for patients with unhealthy alcohol use, as has been demonstrated for patients of minority race/ethnicity [44] and obese patients [45].

Both patients engaging in current unhealthy alcohol and their providers were less verbally activated or engaged than in encounters with patients without unhealthy drinking. Patient activating/engagement statements often reflect a patient's knowledge, skill, and confidence in managing a chronic illness [46]. Studies in general medical patients demonstrate that more activated patients exhibit improved self-management behaviors and chronic illness outcomes [47]. These findings suggest that unhealthy drinkers with HIV infection are at especially high risk of poor HIV-related outcomes, though further research is required to evaluate that possibility.

Of particular concern is our finding that patients with current unhealthy alcohol use were less likely to receive psychosocial or counseling statements from their HIV providers as their level of depression increased. Providers appropriately directed their psychosocial counseling statements to those with greater depression scores in patients without unhealthy alcohol use, but progressively curtailed these statements in encounters with former and current unhealthy drinkers. This finding generates several hypotheses to address in future research. Such an interaction may potentially be due to providers' limited capacity to address other issues when severe alcohol problems overwhelm a clinic visit, or deferred diagnosis of mental health disorders in the context of active alcohol abuse. Provider or systems interventions that focus attention on mental health issues and allow for more resources and time to be devoted to these issues in patients with unhealthy alcohol use may represent an opportunity for improved care in this highly vulnerable population.

In contrast to encounters with unhealthy alcohol users, patient-provider encounters with current illicit drug users were characterized by more statements across multiple communication behaviors vs. encounters with non-users. Likewise, patient-rated communication quality and satisfaction were comparable regardless of illicit drug use. Although both patients and providers made more negative statements in the setting of current drug use, these may indicate less conflict avoidance and, as such, may actually be an indication of higher quality communication [48]. This is consistent with the observation that patients with current illicit drug use were also more likely to receive more questions from their provider and to make more engagement/activating, information giving, biomedical, and psychosocial/counseling statements compared with non-users. Further research is necessary to understand differences in communication patterns observed among unhealthy alcohol and illicit drug users.

This study's findings should be interpreted in light of potential limitations. First, we were unable to assess the content of specific substance use dialogues. Though clear differences in communication behaviors and ratings were observed in patients with alcohol use, further research is required to assess the degree to which these difference may have been associated with discussion of substance use. Second, it is possible that audio-recording providers could have altered their communication behaviors to be on "best behavior" (i.e., potential Hawthorne effect). Available evidence from communication studies in general medical populations, however, does not support the assertion that this is a large or important effect [49,50]. Third, self-reported substance use may be underestimated due to social desirability bias. Though the ASI-lite alcohol and drug use items have been well validated [28,51], we were unable to collect urine drug screens or other more objective measures of substance use. Finally, our convenience sample of HIV-infected patients receiving care in expert HIV treatment clinics may not be representative of patient-provider communication in other settings, though observed rates of self-reported substance use were comparable to those reported for HIV-infected patients receiving care in HIV Research Network clinics [2] and in a nationally representative sample of HIV-infected patients in care [1].

In conclusion, our data suggest that gaps exist in the quality of both patient-rated and directly observed patient-provider communication for HIV-infected patients with alcohol use. Our study is the first to examine directly observed patient-provider communication among HIV-infected patients by substance use history, and the first to identify an interaction between alcohol use and depression in receipt of psychosocial counseling communication. Observed gaps in the quality of patient-provider communication may be an overlooked domain in current models of the quality of HIV care. Improving patient-provider communication may represent a potential intervention to improve quality of care for HIV-infected patients with substance use, particularly those engaging in unhealthy drinking.

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Fig. 1.
Interaction between unhealthy alcohol use and depression (Wald χ^2 (df = 4) = 13.9, P = 0.008 for overall interaction term)

Table 1

Participant characteristics (n = 413)

Patient characteristics (%)	All (n = 413)	Unhealthy alcohol use		Illicit drug use		
		Current (n = 39)	Former (n = 198)	Never (n = 170)	Current (n = 113)	Former (n = 203)
Mean age, years (SD)	45 (9.4)	39 (9.1)	46 (9.1)	45 (9.5)	43 (8.1)	47 (9.0)
Female	146 (35)	7 (18)	63 (32)	74 (44)	33 (29)	75 (37)
Race						
White	93 (23)	13 (34)	47 (24)	33 (19)	31 (27)	39 (19)
African-American	240 (58)	18 (46)	106 (54)	110 (65)	62 (55)	123 (61)
Latino	57 (14)	4 (10)	32 (16)	21 (12)	13 (12)	28 (14)
Other	23 (5)	4 (10)	13 (6)	6 (4)	7 (6)	13 (6)
High school degree	296 (72)	30 (77)	146 (74)	115 (68)	80 (71)	145 (71)
On ARV	315 (78)	32 (82)	155 (79)	124 (75)	78 (70)	165 (83)
Mean CD4 (SD)	472 (331)	410 (315)	485 (342)	467 (321)	436 (374)	466 (320)
Provider characteristics						
Female provider	248 (60)	15 (39)	71 (37)	53 (33)	42 (38)	67 (35)
Provider having "very busy day"	141 (36)	20 (51)	123 (62)	103 (61)	68 (60)	132 (65)
≥5 years seeing provider	139 (34)	8 (21)	73 (37)	56 (33)	34 (30)	74 (37)
						31 (32)

Table 2

Associations between unhealthy alcohol use and communication behaviors

RIAS summary scores	Current Mean (SD)	Former Mean (SD)	None Mean (SD)	Former versus none β Coefficient (95% CI) ^a	Current versus none β Coefficient (95% CI) ^a
Visit length (min)	22.2 (8.43)	22.9 (9.46)	26.9 (14.6)	-3.36 (-5.81, -0.92) ^c	-4.72 (-8.70, -0.74) ^c
Provider verbal dominance	1.44 (0.57)	1.36 (0.53)	1.31 (0.50)	0.03 (-0.09, 0.14)	0.11 (-0.08, 0.29)
Provider behaviors	Mean (SD)	Mean (SD)	Mean (SD)	IRR (95% CI) ^b	IRR (95% CI) ^b
Positive statements	47.8 (20.3)	52.6 (26.2)	56.8 (29.9)	0.95 (0.86, 1.05)	0.91 (0.77, 1.07)
Negative statements	0.79 (1.63)	1.70 (2.67)	1.44 (2.14)	1.13 (0.85, 1.52)	0.65 (0.36, 1.17)
Question asking	45.5 (26.8)	43.7 (25.2)	50.9 (28.3)	0.92 (0.83, 1.03)	0.93 (0.78, 1.12)
Information giving	139 (73.4)	142 (74.1)	157 (89.8)	0.90 (0.80, 1.02)	0.87 (0.72, 1.06)
Engagement/activation	39.6 (19.0)	44.6 (28.5)	47.5 (31.6)	0.88 (0.77, 0.99) ^c	0.81 (0.66, 1.00) ^d
Biomedical talk	154 (78.9)	150 (73.9)	164 (84.6)	0.92 (0.83, 1.03)	0.98 (0.82, 1.17)
Psychosocial talk	30.8 (42.4)	35.7 (31.9)	44.2 (42.6)	0.85 (0.71, 1.01)	0.60 (0.43, 0.82) ^c
Patient behaviors	Mean (SD)	Mean (SD)	Mean (SD)	IRR (95% CI) ^b	IRR (95% CI) ^b
Positive statements	56.9 (25.6)	69.1 (37.2)	77.0 (44.4)	0.91 (0.81, 1.02)	0.77 (0.63, 0.94) ^c
Negative statements	2.69 (5.59)	2.89 (4.92)	3.28 (4.42)	0.71 (0.53, 0.95) ^c	0.70 (0.42, 1.16)
Question asking	8.56 (6.95)	9.67 (7.52)	10.2 (8.90)	0.90 (0.75, 1.08)	0.88 (0.64, 1.20)
Information giving	152 (90.4)	154 (82.7)	165 (93.6)	0.90 (0.81, 1.01)	0.89 (0.73, 1.08)
Engagement/activation	5.56 (5.09)	8.05 (7.51)	7.75 (7.21)	0.96 (0.79, 1.16)	0.68 (0.47, 0.98) ^c
Biomedical statements	104 (70.9)	100 (55.4)	107 (67.3)	0.91 (0.80, 1.03)	0.98 (0.79, 1.20)
Psychosocial talk	56.5 (61.3)	63.8 (58.6)	68.3 (54.2)	0.89 (0.75, 1.07)	0.76 (0.56, 1.03)

Each row represents an individual multivariate model, with substance use as independent variable and communication behavior as dependent variable

^aLinear regression models adjusted for patient gender, race, age, education, depression, and concomitant alcohol/drug use and provider-rated clinic busyness on day of encounter, gender, duration of patient-provider relationship, site, and clustering by provider

^bPoisson regression models adjusted as above, and corrected for overdispersion of variance. *IRR* incidence rate ratio, *CI* 95% confidence interval

^c*P*-value<.05

^d*P*-value = .053

Table 3

Associations between illicit drug use and communication behaviors

RIAS summary scores	Current Mean (SD)	Former Mean (SD)	None Mean (SD)	Former versus none β Coefficient (95% CI) ^a	Current versus none β Coefficient (95% CI) ^a
Visit length (min)	24.2 (10.2)	23.6 (11.3)	26.3 (14.6)	-1.37 (-4.03, 1.29)	-0.17 (-3.10, 2.76)
Provider verbal dominance	1.44 (0.65)	1.26 (0.43)	1.44 (0.49)	-0.20 (-0.32, -0.07) ^c	-0.10 (-0.24, 0.03)
Provider behaviors	Mean (SD)	Mean (SD)	Mean (SD)	IRR (95% CI) ^b	IRR (95% CI) ^b
Positive statements	53.1 (24.8)	54.1 (27.9)	53.3 (29.2)	1.06 (0.95, 1.19)	1.05 (0.93, 1.18)
Negative statements	1.88 (2.63)	1.52 (2.55)	1.18 (1.76)	1.17 (0.81, 1.67)	1.77 (1.22, 2.58) ^c
Question asking	51.6 (27.1)	44.7 (25.5)	46.3 (29.2)	0.99 (0.88, 1.12)	1.14 (1.00, 1.30) ^d
Information giving	156 (81.4)	139 (79.7)	156 (83.5)	0.97 (0.85, 1.10)	1.06 (0.92, 1.22)
Engagement/activation	45.5 (27.3)	46.3 (30.3)	43.0 (28.6)	1.10 (0.96, 1.27)	1.09 (0.94, 1.28)
Biomedical talk	160 (74.4)	151 (79.8)	163 (84.0)	0.98 (0.87, 1.10)	1.04 (0.91, 1.18)
Psychosocial talk	47.8 (51.5)	33.5 (30.3)	39.7 (32.1)	0.96 (0.78, 1.17)	1.22 (0.98, 1.51)
Patient behaviors	Mean (SD)	Mean (SD)	Mean (SD)	IRR (95% CI) ^b	IRR (95% CI) ^b
Positive statements	65.7 (32.3)	73.4 (42.8)	72.8 (40.9)	1.09 (0.96, 1.24)	1.02 (0.88, 1.18)
Negative statements	3.61 (6.15)	3.31 (4.55)	1.73 (2.63)	1.81 (1.22, 2.68) ^c	2.04 (1.34, 3.10) ^c
Question asking	10.3 (8.00)	9.57 (7.88)	9.44 (8.60)	1.06 (0.87, 1.31)	1.22 (0.97, 1.52)
Information giving	164 (83.5)	162 (91.9)	142 (82.3)	1.17 (1.03, 1.34) ^c	1.25 (1.08, 1.44) ^c
Engagement/activation	8.10 (7.10)	7.94 (7.35)	6.53 (6.83)	1.16 (0.93, 1.45)	1.36 (1.07, 1.73) ^c
Biomedical statements	101 (57.8)	109 (65.2)	91.9 (57.8)	1.22 (1.06, 1.41) ^c	1.20 (1.02, 1.41) ^c
Psychosocial talk	73.2 (59.6)	62.5 (59.2)	59.1 (46.6)	1.08 (0.88, 1.33)	1.30 (1.04, 1.62) ^c

Each row represents an individual multivariate model, with substance use as independent variable and communication behavior as dependent variable

^aLinear regression models adjusted for patient gender, race, age, education, depression, and concomitant alcohol/drug use and provider-rated clinic busyness on day of encounter, gender, duration of patient-provider relationship, site, and clustering by provider

^bPoisson regression models adjusted as above, and corrected for overdispersion of variance. *IRR* incidence rate ratio, *CI* 95% confidence interval

^c*P*-value < .05

^d*P*-value = .059

Table 4
Patient-rated communication quality in patients with current, former, and no unhealthy alcohol or illicit drug use

	No use % Optimal	Former use % Optimal	Former versus no use aOR (95% CI) ^a	Current use % Optimal	Current versus no use aOR (95% CI) ^a
Unhealthy alcohol use					
Satisfaction with care	68.6	60.4	0.69 (0.41, 1.17)	38.5	0.36 (0.15, 0.84) ^b
Overall communication quality	47.1	22.7	0.35 (0.20, 0.61) ^b	18.0	0.24 (0.09, 0.66) ^b
HIV-specific comm	39.4	25.3	0.52 (0.29, 0.91) ^b	18.0	0.31 (0.11, 0.89) ^b
Adherence-specific comm	60.0	52.7	0.65 (0.38, 1.12)	41.7	0.43 (0.18, 1.04)
Illicit drug use					
Satisfaction with care	69.8	63.4	0.83 (0.46, 1.51)	52.2	0.69 (0.37, 1.31)
Overall communication quality	37.1	29.1	1.19 (0.64, 2.19)	33.6	1.80 (0.92, 3.54)
HIV-specific comm	34.0	32.5	1.17 (0.64, 2.14)	23.9	0.89 (0.44, 1.77)
Adherence-specific comm	62.6	53.9	0.78 (0.43, 1.40)	47.6	0.67 (0.35, 1.30)

^aLogistic regression models adjusted for patient gender, race, age, education, depression, and concomitant drug/alcohol use and provider-rated clinic busyness on day of encounter, gender, duration of patient-provider relationship, site, and clustering by provider. aOR adjusted odds ratio, CI 95% confidence interval

^bP-value<.05