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Patterns of substance abuse treatment seeking following cocaine-related emergency department visits

JC Fortney, SP Tripathi, MA Walton, RM Cunningham, and BM Booth

VA Mental Illness Research, Education, and Clinical Center, 2200 Fort Roots Drive, North Little Rock, AR 72114, USA. fortneyjohnc@uams.edu

Abstract

Chest pain is the most common medical complaint among cocaine-using emergency department (ED) patients. Correlates of substance abuse treatment seeking were examined using 3-month post-discharge surveys from 170 ED patients admitted with cocaine-related chest pain. Four treatment categories were specified as the dependent variable in an ordered logistic regression: no treatment (74.7%), informal treatment only (7.1%) formal treatment only (5.9%) both formal and informal treatment (12.4%). The following variables were found to be positively associated with a higher treatment category: frequency of cocaine use (OR=1.07; CI₉₅=1.01-1.15, p=0.03), global severity index (OR=2.26, CI₉₅=1.04-4.90; p=0.04) number of endorsed stigma barriers (OR=4.40; CI₉₅=1.41-13.78; p=0.01), interpersonal consequences (OR=1.41; CI₉₅=1.01- 1.88; p=0.02), and pre-baseline informal treatment (OR=6.69; CI₉₅=1.58-28.36, p=0.01). Physical consequences were found to be negatively associated with a higher treatment category (OR=0.63, CI₉₅=0.47-0.85; p<0.01). ED visits for cocaine-related chest pain represent missed opportunities to link patients to substance abuse treatment and interventions are needed to motivate patients to seek care.

Keywords

Cocaine; Chest Pain; Emergency Department; Utilization

Introduction

An estimated 14.2% of the U.S population have used cocaine in their lifetime.¹ Among users of cocaine in the past year, 27.8% (1.5 million Americans) were estimated to meet 12-month abuse or dependence criteria.¹ The majority (82.3%) of Americans meeting diagnostic criteria for illicit drug abuse/dependence in the past year do not receive formal substance abuse treatment.¹ The vast majority (91%) of those meeting diagnostic criteria who do not receive treatment do not perceive a need for treatment.¹ Of those who do perceive a need for treatment, only 32.4% make an effort to receive care, citing such reasons as: cost or insurance barriers (38.8%), not ready to stop using (36.4%), stigma (21%), lack of transportation (16%), or thought they could handle the problem without treatment (15.1%).¹ Clearly, effective strategies are needed to link those individuals with cocaine dependence/abuse to substance abuse treatment.

One potential gateway to the formal health system for cocaine abusing or dependent individuals is the local Emergency Department (ED). Illicit drug use is a significant

predictor of ED use.² The Drug Abuse Warning Network (DAWN) estimated that there were 717,194 illicit-drug related ED visits in the U.S. in 2004.³ Cocaine is the most commonly reported illicit drug in the ED setting accounting for over half of all illicit drug-related ED visits in 2004 (383,350)³ and cocaine-related ED visits have been increasing over time.⁴ Cardiovascular consequences of cocaine use are substantial⁵⁻⁸ and users of cocaine often experience chest pain, prompting them to seek care in the ED over concern that their cocaine use has caused a “heart attack” or myocardial infarction. Chest pain is the most common presenting medical complaint among cocaine-using ED patients, accounting for 40% of cocaine-related cases.⁹ Conversely, among individuals presenting to an urban or inner city ED with chest pain, approximately 15-20% are recent cocaine users.^{10,11}

The Health Belief Model¹²⁻¹⁴ predicts that patient perceptions about the need for addiction treatment may be particularly modifiable shortly after one experiences a negative consequence from substance use (e.g., social, employment, legal, and health problems). Thus, potentially important cues for seeking addiction treatment include negative consequences¹⁵⁻¹⁷ and related encounters with the health care system.¹⁸ ED visits may represent an opportunity to motivate large numbers of cocaine users to seek substance abuse treatment. Perceptions about the need for addiction treatment may be particularly modifiable shortly after experiencing a potentially life threatening physical health consequence of cocaine use. EDs could serve as an important gateway to addiction treatment if detection and referral were prioritized during these emergency encounters.¹⁹

Despite the opportunity for substance abuse intervention or referral, only a third of ED patients with chest pain recall being questioned about their cocaine use in the emergency room and only 13% of ED chest pain patients have documentation of cocaine use or nonuse in their medical chart.¹⁰ Cocaine use among ED patients, as measured by urine drug screens, is two to three times greater than physician estimates.²⁰ There are no reports in the literature about how often ED staff address cocaine use or refer patients to substance abuse treatment programs when cocaine use is detected. Likewise, there are no published data about patients’ help-seeking behaviors following ED visits for cocaine-related chest pain. Such help-seeking data is critical for the development of interventions designed to link patients with substance abuse treatment services.

This study examined the subsequent short-term (three-month) use of informal and formal substance abuse treatment services among ED patients with cocaine-related chest pain. Based on the Health Belief Model and the Stages of Change Model, it was hypothesized that use of substance abuse treatment services would be positively correlated with need for treatment, cues (including negative physical consequences of cocaine use) and readiness to change, and that use of services would be negatively correlated with barriers to care. In addition, because referrals between the formal and informal treatment sectors are common, it was hypothesized that use of services in one sector would be positively correlated with use of services in the other sector.

Methods

Study setting and subject enrollment

The study was conducted at the Emergency Department Chest Pain Observation Unit (CPOU) of Hurley Medical Center, a large urban, university-affiliated level-1 trauma center located in Flint, Michigan. The study was approved by the investigators' institutional review boards. Details about recruitment, screening, inclusion/exclusion criteria and enrollment are reported in detail elsewhere^{21,22} and summarized briefly here. Patients were recruited from the ED during their assessment for potential acute coronary syndrome or myocardial infarction. As a part of usual care in this chest pain observation unit, all patients under 60 undergo urine toxicology screening for cocaine.

The study used a two-stage recruitment and enrollment process. In phase one of the recruitment, patients age 18-60 who presented to the ED with chest pain between June 1, 2002 and February 29, 2004 were asked to provide written consent to allow research staff to review their medical records for determination of study eligibility. Inclusion criteria included chief complaint of chest pain, age 18-60 and a positive toxicological urine screen for cocaine or physician documentation of self-reported cocaine use. Exclusion criteria included inability or refusal to provide informed consent, pregnancy, acute suicidal ideation, and those patients whom the medical staff deemed very likely to be having an acute heart attack as a result of their cocaine use (which mandated more intensive medical care, cardiac catheterization, ICU admission, or intravenous medication to stabilize the heart rhythm). Current engagement in substance abuse treatment was not specified as an exclusion criterion because few patients were expected to be currently engaged in treatment. In fact, in the three months prior to the ED visit, only 4.1% reported receiving formal substance abuse treatment and only 5.3% reported receiving informal substance abuse treatment. Of 2,342 identified patients, 93.7% (n=2,195) consented to medical record review, and among the 89.1% (n=1,956) of patients with a documented urine screen, 15.4% (n=302) screened positive for cocaine use. In phase two of recruitment, eligible patients were asked to provide written informed consent to participate in the study, and 73% (n=219) agreed to participate. At that point, all potential participants were notified that their urine screen was positive for cocaine. After completing the informed consent and the baseline interview, a social worker funded by the study handed the patient a printed list of local substance abuse treatment services. Providing a list of substance abuse treatment programs to patients screening positive for cocaine was not usual care at the ED.

Data collection

Consenting subjects completed a two-hour baseline interview before leaving the ED to provide information about socio-demographics, substance abuse history, and mental health. The Substance Abuse Outcomes Module²³ was used to measure socio-demographics, lifetime substance abuse and dependence (0/1), frequency of alcohol use in past month (range: 0-28 days), frequency of cocaine use in past month (range: 0-28 days), use of formal substance abuse treatment services in past year (0/1) participation in a self help program in past year (0/1), support for sobriety (range: 0-100), antisocial personality disorder (0/1), a count of chronic physical illnesses (range: 0-22), and substance-related consequences from

the InDUC-2R,²⁴ including physical consequences, intrapersonal consequences, interpersonal consequences, impulse control consequences and social responsibility consequences (0 – never, 1 – once or a few times in past month, 2 – once or twice a week, 3 – daily or almost daily; range 0-9). The Substance Abuse Outcomes Module also includes items about potential barriers to substance abuse treatment, which were divided into five domains: 1) geographical/financial barriers (3 items, including “Couldn’t afford to pay the bill”), 2) temporal barriers (5 items, including “I couldn’t get time off work”), 3) stigma barriers (4 items, including “Would be afraid I would lose my job”), 4) treatment perceived to be ineffective/unacceptable (4 items, including “Don’t think anyone could help”), and 5) lack of perceived need (3 items, including “Want to keep using drugs or alcohol”)

The SF36 was used to measure physical health and mental health status (range: 0-100).²⁵ The Brief Symptom Inventory²⁶ was used to measure psychological distress based on the symptom severity of somatization, obsessive compulsive disorder, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism (0 – not at all, 1 – a little bit, 2 – moderately, 3 – quite a bit, 4 – extremely; range: 0-4). The stages of change readiness and treatment eagerness scale (SOCRATES) was used to assess readiness to change along three dimensions, ambivalence (range: 4-20), recognition (range: 7-35) and taking steps (range: 8-40).²⁷ The ambivalence and recognition scales were combined (range: 11-55) because they were highly correlated and exploratory factor analysis identified two factors that accounted for 95% of the variance. Social support was measured using the scale developed for the Medical Outcomes Study²⁸, which includes 19 items asking about how often someone would be available to help with emotional issues or tangible problems (e.g., chores and transportation) as well as positive social relationships (range: 1-5; all of the time to none of the time).

Three month follow-up interviews were completed for 78% (N=170) of the baseline sample. The follow-up interview included questions about the use of formal and informal treatment services. Formal treatment was defined as receiving services between the baseline and three-month follow-up interviews from any of the following programs: inpatient detoxification, inpatient treatment program, outpatient detoxification, outpatient treatment program, halfway house, residential program or therapeutic community, and methadone maintenance. Informal treatment was defined as participating in a substance abuse self-help program during the three-month follow-up period. The dependent variable was specified with four mutually exclusive ordered categories with higher levels representing more treatment: no-treatment (0), informal treatment only (1), formal treatment only (2), both informal and formal treatment (3).

Data analysis

Attrition weights were calculated and used in the multivariate analysis to adjust for the potential bias associated with loss to follow-up. Attrition weights were calculated using baseline interview data and reflected the inverse probability of completing the three-month follow-up interview. Weights were calculated using predictions from a logistic regression analysis with completion of the follow-up specified as the dependent variable and those

baseline characteristics that were significantly ($p<0.2$) correlated with completion in bivariate analyses specified as explanatory variables.

Ordered logistic regression models were estimated to model the four levels of treatment. No variables were transformed prior to analysis. Baseline variables were included as independent variables in the multivariate analysis if they were significantly ($p<0.1$) correlated with the dependent variable in bivariate analyses. Among the available domains in the Brief Symptom Inventory, only the global severity index was considered a candidate variable for the multivariate analysis. Given the percentage of study participants in each substance abuse treatment category (see results) and an alpha significance level of 0.05, there was 0.8 power to detect a proportional odds ratio of 2.0 for a dichotomous independent variable with 50% prevalence.²⁹

Results

Study participants ($n=170$) were evenly distributed according to gender with an average age of 39 (Table 1). Three quarters were African American (78.2%), relatively few were married (20.0%) or employed (37.1%), and 74.1% had annual incomes $<\$20,000$. Three quarters (76.5%) met DSM-IV criteria for lifetime substance dependence and another 10% met criteria for lifetime substance abuse. In the month prior to the ED visit, the average number of days of cocaine use was 7. On average, ED patients in the sample had 1.8 physical health comorbidities (e.g., asthma, diabetes, migraine headaches, tuberculosis) and reported moderate physical consequences (e.g., my physical appearance has been harmed by my drinking or use of drugs; my physical health has been harmed by my drinking or use of drugs). The SF36 physical health and mental health component scores were similar to those in the general U.S. population. Almost a third met criteria for antisocial personality disorder, though overall psychological distress was mild (e.g., bothered by each symptom “a little bit”). There were relatively few endorsed barriers at baseline. The most commonly (31.8%) endorsed potential barrier related to a lack of perceived need for treatment (“Didn’t think my problem was serious enough”).

About a quarter (25.3%, $n=43$) of the sample reported seeking treatment in the three months after their ED visit, with 7.1% ($n=12$) seeking informal treatment only, 5.9% ($n=10$) seeking formal treatment only, and 12.4% ($n=21$) seeking both informal and formal treatment. Bivariate analysis indicated that the use of formal and informal treatment in the three months after being discharged from the ED was highly correlated, as hypothesized. Of those receiving informal treatment, 63.6% also received formal treatment, while 67.7% of those receiving formal treatment also received informal services ($\chi^2=70.7$, $p<0.0001$).

Table 2 presents descriptive statistics for the sub-samples receiving no treatment, informal treatment only, formal treatment only and both informal and formal treatment. Number of days using cocaine in prior 4 weeks had a clear linear positive association with the categories of service use. Likewise, all the negative consequence scales appeared to have clear linear positive association with the categories of service use. Bivariate analyses indicated that 17 variables were associated with services use category at the $p<0.1$ level and were included in the multivariate ordered logistic regression analysis (Table 3).

Socio-economic variables

None of the demographic or economic variables were found to be significantly correlated with the ordered categories of substance abuse treatment seeking.

Need Variables

As hypothesized, the frequency of cocaine use was a positive and significant predictor (OR=1.10; CI₉₅=1.02-1.17, $p<0.01$), with each additional day of cocaine use increasing the odds by 1.1. The global severity index was also a significant positive predictor (OR=2.26, CI₉₅=1.04-4.90; $p=0.04$), with a one category increase in severity (e.g., from moderately to quite a bit) increasing odds by 2.3. Meeting diagnostic criteria for lifetime substance abuse/dependence was not a significant predictor, nor was overall mental health status as measured by the SF36.

Barrier Variables

An unexpected finding was that stigma was a positive and significant predictor (OR=4.40; CI₉₅=1.41-13.78; $p=0.01$), with each additional stigma barrier increasing the odds by 4.4. The other barrier domains were not significant predictors.

Cue Variables

Two of the four cue variables were significant predictors. As hypothesized, the interpersonal consequences variable was positively and significantly associated with higher categories of service use (OR=1.41; CI₉₅=1.01-1.88; $p=0.02$). For example, increasing the frequency of interpersonal consequences (e.g., my family has been hurt) from once or twice in the past three months to once or twice a week increases the odds by 1.4. Contrary to our hypothesis, the physical consequences of substance abuse variable was negatively and significantly associated with higher categories of service use (OR=0.63, CI₉₅=0.47-0.85; $p<0.01$). For example, increasing the frequency of a physical consequences (e.g., not eaten properly) from once or twice in the past three months to once or twice a week decreases the odds by 0.6. Note that while the physical consequences variable was significantly *positively* associated with category of service use in bivariate analysis, it was significantly *negatively* associated with category of service use in the multivariate ordered logistic regression analysis. This is known as a “suppressor effect”, and is due to the fact the physical consequences variable was strongly and positively correlated with the other consequence variables, which were in turn, strongly and positively correlated with service use category.³⁰ When the other consequence variables were controlled for in the multivariate analysis, the true direction of the association between physical consequences and service use category emerged. The physical health consequences variable was also highly correlated with the ambivalence/recognition readiness to change variable ($r=0.65$, $p<0.001$). However, multi-collinearity was not an issue, as the parameter estimate for physical health consequences remained significantly negative even after the ambivalence/recognition scale was dropped from the regression equation.

Readiness to Change Variables

Contrary to our hypotheses, the measures of readiness to change as measured by the SOCRATES were not significantly related to category of service use. Likewise, pre-baseline use of formal services was not found to be a significant predictor of service use category in the follow-up period. However, pre-baseline use of informal services was found to be a significant and substantial predictor of service use category in the follow-up period (OR=6.69; CI₉₅=1.58-28.36, p=0.01).

Discussion

Fewer than one in five of patients admitted to the ED with chest pain and identified as a cocaine user via urine screens sought formal substance abuse treatment during the three months post-discharge. Despite the serious physical consequences of cocaine use in this sample, this rate of formal treatment seeking (18.2%) was not much higher than the formal treatment seeking rate (17.7%) for adults in the general population who met illicit drug abuse/dependence criteria in the past 12 months.¹ Although the rate of formal treatment seeking during the 3-month post-discharge period (18.2%) is considerably higher than the rate during the 3-month pre-admission period (4.1%), it is only marginally higher than the rate during the 12-month pre-admission period (12.9%). Thus, these ED visits represent missed opportunities to link substantial numbers of patients with needed substance abuse treatment.

As expected, the use of formal and informal substance abuse treatment services were highly complementary. Most of the patients receiving treatment in the three months after being discharged from the ED received care from both sectors. It remains unknown whether patients sought care first in the formal or informal sector. It is possible that clinicians in the formal sector encourage patients to seek informal care (perhaps including it in the treatment plan). It is also possible that peers in the informal sector encouraged patients to seek formal treatment.

Measuring patient characteristics across multiple theoretically supported domains (e.g., need, barriers, cues, and readiness to change), this study identified few significant predictors of receiving substance abuse treatment services. Two of the need indicators (frequency of cocaine use and global severity index) were significant predictors, which is consistent with research conducted in the general population.³¹⁻³³ Only one cue variable (interpersonal consequences) predicted service use category as hypothesized. Those with more and more frequent interpersonal consequences were significantly more likely to receive a higher category of treatment. Contrary to the hypothesis about cues, patients with greater physical health consequences were significantly less likely to receive a higher category of treatment. It should be noted that patients with the most severe physical health problems (e.g., those patients requiring ICU admission) were excluded from the study. Nevertheless, these findings are not consistent with previous studies conducted in the general population which have found that physical health consequences are positively correlated with receiving substance abuse treatment.^{31,33} However, subjects in these previous studies were not sampled from a clinical setting where they were seeking medical treatment for the physical health consequences of their substance use. In the context of primary care, the “competing

demands” of physical health disorders has been shown to reduce the likelihood of detecting and treating depression.^{34,35} In the ED context, it could be that staff had less time to counsel patients with more severe physical health problems about getting substance abuse treatment or that patients with more severe physical health problems placed a lower priority on their substance abuse problems relative to their physical health problems. Another potential explanation is that patients experiencing physical health consequences of substance abuse felt more motivated to remain abstinent, thereby decreasing their perceived need for substance abuse treatment. Conversely, it is also possible that those suffering physical health consequences of substance abuse may have believed that their disease had progressed beyond the point at which addiction treatment would be beneficial. Regardless of the reason(s), these findings indicate that patients with greater physical health consequences of their substance abuse may need a targeted intervention to successfully link them to substance abuse treatment.

Few of the readiness to change variables were significant predictors of treatment-seeking. Specifically, these results do not support the predictive validity of the SOCRATES in terms of initiating substance abuse treatment in the ED setting. Although some studies find that the SOCRATES does predict treatment entry,³⁶ others do not.³⁷ For example, Yonas and colleagues, found that although 85% of trauma patients with positive drug screens were in the contemplative or action-oriented stages with regard to their substance abuse, 0% initiated substance abuse treatment postdischarge.³⁷ However, it is possible that this measure may be useful as a starting place for brief motivational interventions to encourage treatment linkage. Our finding that pre-baseline use of formal treatment services was not a significant predictor of service use in the follow-up period is not consistent with the findings from prior studies conducted in the general population.^{32,33} However, pre-baseline use of informal services did predict service use in the follow-up period. This may represent a continuation of self-help behaviors from the pre-admission period to the post-discharge period.

Unexpectedly, those endorsing a greater number of potential stigma barriers to care were significantly more likely to receive a higher category of treatment. The stigma barrier items included: “Would be too embarrassed to discuss my drug or alcohol use with anyone”; “Would be afraid of what others would think”; “Family would object”; and “Would be afraid I would lose my job.” The non-intuitive finding that greater stigma is positively correlated with service use may reflect that patients attempting to seek treatment in the past may have become more aware of the public stigma associated with seeking treatment. In other words, those with a high propensity to seek treatment in the past (and presumably in the future) may have had more accurate perceptions of the public stigma that is directed toward those with substance dependence and abuse. Booth and colleagues report a similarly counterintuitive finding that rural at-risk drinkers with longer perceived travel times to substance abuse treatment at baseline were more likely to use substance abuse treatment services at follow-up.³¹ Again, this finding may reflect that those with a high propensity to seek substance abuse treatment may have had a more accurate perception of the long travel times that would be required.

This study presents the first data available about use of substance abuse treatment for patients presenting to the ED with medical (i.e., non-injury) consequences of substance

abuse, in this case cocaine-related chest pain. These cocaine-related chest pain patients represent 15% of all chest pain patients in this inner-city ED. Strengths of the study include limited exclusion criteria, high recruitment and retention rates, theoretically derived hypotheses, and a comprehensive baseline assessment of health status using well-validated instruments. This study should also be viewed in light of several limitations. The single study site limits the generalizability of the findings with respect to other types of facilities and different geographic areas (e.g., rural). In addition, the sample size was relatively small and the statistical power was not sufficient to detect small effect sizes. Further, at this site, every chest pain patient under 60 was given a urine drug screen, which is atypical for most medical centers. The two hour baseline interview itself may have also been a “cue” for needing substance abuse treatment, and thus these results may overestimate the rate of substance abuse treatment seeking among cocaine-positive chest pain ED patients.

Implications for Behavioral Health

Individuals' contacts with emergency health services can serve as important cues to substance abuse treatment seeking precisely when those individuals are most likely to be ready to engage in addiction treatment. It is crucial that linkage to addiction treatment be facilitated during these contacts. Although the prevalence of substance abuse in emergency department patients is high, especially among injury patients,^{4,38-41} ED clinicians detect less than half of substance use problems and even fewer patients get referred for treatment.^{40,42-45} Cost-effective interventions need to be developed for these settings to identify and motivate patients with current substance abuse problems to seek treatment.

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Table 1

Baseline characteristics of patients with a cocaine-related ED visit

Variables	Percentage/ Mean (Standard Deviation)
Socio-Economic Variables	
Age	38.47 (8.88)
Male	58.2 %
African American	78.2 %
Never Married/Single	80.0 %
High School Graduate	57.1 %
Employed	37.1 %
Income Category	
Less than \$10,000	36.5 %
\$10,000-\$19,999	37.7 %
\$20,000 or more	25.9 %
Need Variables	
Met lifetime substance dependence criteria (0/1)	76.5 %
Met lifetime substance abuse criteria (0/1)	10.0 %
# of drinking days in prior 4 weeks (0-28)	10.7 (10.3)
# of days using cocaine in prior 4 weeks (0-28)	6.9 (8.4)
Number of Medical comorbidities (0-22)	1.8 (1.9)
<i>Psychiatric comorbidities (0-4)</i>	
Somatization	1.1 (0.9)
Obsessive-Compulsive Disorder	1.0 (0.9)
Interpersonal sensitivity	0.9 (1.1)
Depression	1.2 (1.1)
Anxiety	1.0 (0.9)
Hostility	0.8 (0.9)
Phobic anxiety	0.5 (0.7)
Paranoid ideation	0.9 (1.0)
Psychoticism	0.8 (0.9)
Additional items	1.3 (1.1)
Global severity index	1.0 (0.8)
Antisocial personality disorder (0/1)	30.6%
<i>SF-36 (0-100)</i>	
Mental health component score	51.0 (25.3)
Physical health component score	56.9 (28.4)
Barriers to Care Variables	
Geographical/Financial barriers (1-3)	0.3 (0.6)
Temporal barriers (1-5)	0.1 (0.3)
Stigma barriers (1-5)	0.1 (0.5)

Variables	Percentage/ Mean (Standard Deviation)
Treatment ineffective/unacceptable (1-4)	0.1 (0.3)
Lack of perceived need (1-3)	0.4 (0.5)
Cue Variables	
Negative life events	3.0 (2.4)
<i>Consequences of Substance Abuse (0-9 scale)</i>	
Physical consequences	3.3 (3.0)
Interpersonal consequences	3.3 (3.4)
Intrapersonal consequences	4.1 (3.3)
Impulse control consequences	2.5 (2.4)
Social responsibility consequences	3.9 (3.1)
Readiness to Change Variables	
<i>Stages of change</i>	
Ambivalence/recognition scale (11-55)	38.9 (12.0)
Taking Steps scale (8-40)	27.5 (7.2)
<i>Social Support</i>	
Average of all types of support (1-5)	4.1 (1.0)
Sobriety support (0-100)	39.4 (28.9)
<i>Prior Treatment</i>	
Formal treatment in prior 12 months (0/1)	12.9 %
Informal treatment in prior 12 months (0/1)	14.7 %

Table 2

Baseline characteristics of patients by treatment group

	No Treatment N=126	Informal Treatment Only N=12	Formal Treatment Only N=10	Both Formal and Informal Treatment N=21
Variables	Percentage/ Mean (SD)	Percentage/ Mean (SD)	Percentage/ Mean (SD)	Percentage/ Mean (SD)
Socio-Economic Variables				
Age	38.6 (9.4)	37.3 (5.9)	35.2 (8.0)	39.7 (7.3)
Male	57 %	50 %	50 %	76 %
African American	79 %	58 %	80 %	86 %
Never Married/Single	77 %	92 %	90 %	86 %
High School Graduate	53 %	67 %	50 %	81 %
Employed	38 %	42 %	30 %	33 %
Income Category				
Less than \$10,000	33 %	33 %	60 %	48 %
\$10,000-\$19,999	37 %	50 %	40 %	33 %
\$20,000 or more	30 %	17 %	0 %	19 %
Need Variables				
Met lifetime substance dependence criteria (0/1)	72 %	83 %	80 %	100 %
Met lifetime substance abuse criteria (0/1)	11 %	8 %	20 %	0 %
# of drinking days in prior 4 weeks (0-28)	10.8 (10.3)	8.2 (9.4)	11.5 (10.7)	11.3 (10.8)
# of days using cocaine in prior 4 weeks (0-28)	5.9 (7.5)	3.0 (2.8)	12.1 (12.2)	12.5 (10.4)
Number of Medical comorbidities (0-22)	1.7 (1.9)	1.8 (1.9)	1.7 (1.9)	2.0 (1.66)
<i>Psychiatric comorbidities (0-4)</i>				
Somatization	1.0 (0.8)	0.9 (0.8)	1.4 (0.8)	1.7 (1.2)
Obsessive-Compulsive Disorder	0.8 (0.9)	1.1 (1.0)	1.5 (0.9)	1.5 (1.0)
Interpersonal sensitivity	0.8 (1.0)	1.2 (1.3)	1.5 (1.3)	1.3 (1.2)
Depression	1.0 (1.0)	1.3 (1.3)	2.2 (1.0)	2.0 (1.1)
Anxiety	0.9 (0.9)	1.2 (1.1)	1.7 (0.8)	1.3 (0.9)
Hostility	0.7 (0.9)	0.7 (0.9)	1.3 (1.0)	1.2 (0.9)
Phobic anxiety	0.4 (0.7)	0.9 (1.0)	1.1 (1.2)	0.6 (0.7)
Paranoid ideation	0.8 (0.9)	1.0 (1.0)	1.3 (1.0)	1.4 (1.1)
Psychoticism	0.6 (0.8)	1.0 (1.1)	1.6 (1.0)	1.5 (1.1)
Additional items	1.1 (1.0)	1.1 (1.2)	2.2 (1.0)	2.1 (1.1)
Global severity index	0.8 (0.7)	1.0 (0.9)	1.6 (0.9)	1.5 (0.8)
Antisocial personality disorder (0/1)	26 %	42 %	50 %	43 %
<i>SF-36 (0-100)</i>				
Mental health component score	53.9 (25.8)	44.2 (27.7)	42.0 (21.0)	41.7 (19.8)
Physical health component score	59.0 (29.0)	49.3 (27.8)	53.0 (26.6)	51.0 (25.5)

	No Treatment N=126	Informal Treatment Only N=12	Formal Treatment Only N=10	Both Formal and Informal Treatment N=21
Variables	Percentage/ Mean (SD)	Percentage/ Mean (SD)	Percentage/ Mean (SD)	Percentage/ Mean (SD)
Barriers to Care Variables				
Geographical/Financial barriers (1-3)	0.3 (0.6)	0.3(0.5)	0.0 (0.0)	0.6 (0.7)
Temporal barriers (1-5)	0.1 (0.3)	0.1(0.3)	0.1 (0.3)	0.2 (0.4)
Stigma barriers (1-5)	0.1 (0.3)	0.2(0.4)	0.2 (0.6)	0.4 (0.8)
Treatment ineffective/unacceptable (1-4)	0.1 (0.3)	0.2(0.4)	0.2 (0.6)	0.2 (0.5)
Lack of perceived need (1-3)	0.5 (0.5)	0.2(0.4)	0.2 (0.4)	0.4 (0.6)
Cue Variables				
Negative life events	2.93 (2.4)	3.0 (2.0)	2.3 (2.5)	3.4 (2.6)
<i>Consequences of Substance Abuse (0-9 scale)</i>				
Physical consequences	2.8 (2.8)	3.1 (3.0)	5.8 (2.7)	5.6 (2.9)
Interpersonal consequences	2.6 (3.1)	3.6 (3.3)	6.1 (3.1)	6.4 (3.1)
Intrapersonal consequences	3.6 (3.2)	3.7 (3.5)	6.4 (2.7)	6.7 (2.6)
Impulse control consequences	2.1 (2.2)	2.0 (2.1)	3.6 (2.4)	4.8 (2.5)
Social responsibility consequences	3.3 (2.9)	3.2 (3.1)	6.1 (2.9)	6.5 (2.6)
Readiness to Change Variables				
<i>Stages of change</i>				
Ambivalence/recognition scale (11-55)	36.8 (12.1)	39.6 (12.0)	47.7 (6.7)	47.4 (7.0)
Taking Steps scale (8-40)	27.6 (7.2)	29.3 (4.4)	24.4 (8.0)	27.2 (7.9)
<i>Social Support</i>				
Average of all types of support (1-5)	4.2 (0.96)	4.4 (0.63)	4.5 (0.65)	3.7 (1.25)
Sobriety support (0-100)	36.1 (28.6)	41.3 (31.5)	51.0 (27.5)	52.3 (26.6)
<i>Prior Treatment</i>				
Formal treatment in prior 12 months (0/1)	8 %	33 %	10 %	33 %
Informal treatment in prior 12 months (0/1)	9 %	42 %	10 %	33 %

Table 3

Predictors of substance abuse treatment following cocaine-related ED visit

Explanatory Variables	Odds Ratio (95% CI)	p-value
Socio-Economic Variables		
High School Graduate	0.49 (0.17-1.42)	0.19
Need Variables		
Met lifetime substance dependence criteria (1/0)	2.94 (0.39-22.12)	0.29
# of days using cocaine in prior 4 weeks (0-28)	1.10 (1.02-1.17)	<0.01
Global Severity Index (0-4)	2.26 (1.04-4.90)	0.04
SF36 Mental health component score	1.00 (0.98-1.03)	0.91
Barrier variables		
Geographical/Financial barriers (1-3)	1.08 (0.48-2.43)	0.85
Stigma barriers (1-5)	4.40 (1.41-13.78)	0.01
Treatment ineffective/unacceptable (1-4)	3.91 (0.77-19.87)	0.10
Lack of perceived need (1-3)	0.51 (0.19-1.38)	0.18
Cue Variables		
<i>Consequences of Substance Abuse (0-9)</i>		
Physical consequences	0.63 (0.47-0.85)	<0.01
Interpersonal consequences	1.41 (1.01-1.88)	0.02
Impulse control consequences	1.25 (0.95-1.66)	0.12
Social responsibilities consequences	0.80 (0.57-1.11)	0.18
Readiness to change variables		
Ambivalence/recognition scale (11-55)	1.02 (0.95-1.09)	0.59
Sobriety support (0-100)	1.01 (0.99-1.03)	0.23
Formal treatment in prior 12 months (1/0)	0.68 (0.16-2.88)	0.60
Informal treatment in prior 12 months (1/0)	6.69 (1.58-28.36)	0.01