Denial of urinalysis-confirmed opioid use in prescription opioid dependence

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Abstract

Although research has generally supported the validity of substance use self-reports, some patients deny urine-verified substance use. We examined the prevalence and patterns of denying urinalysis-confirmed opioid use in a sample of prescription opioid dependent patients. We also identified characteristics associated with denial in this population of increasing public health concern. Opioid use self-reports were compared with weekly urinalysis results in a 12-week multi-site treatment study for prescription opioid dependence. Among those who used opioids during the trial (n=246/360), 44.3% (n=109) denied urinalysis-confirmed opioid use, although usually only once (78%). Overall, 22.9% of opioid-positive urine tests (149/650) were denied on self-report. Multivariable analysis found that initially using opioids to relieve pain was associated with denying opioid use. These findings support the use of both self-reports and urine testing in treating prescription opioid dependence.

Keywords

opioids; prescription opioid dependence; substance use disorder; opioid use disorder; addiction; self-report; urine screens; pain

Introduction

Many studies have investigated the validity of self-reported substance use by comparing self-reports to urinalysis results (Napper, Fisher, Johnson, & Wood, 2010; Schuler, Lechner,

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Carter, & Malcolm, 2009; Solbergsdottir, Bjornsson, Gudmundsson, Tyrfingsson, & Kristinsson, 2004). Contrary to concerns that individuals with substance use disorders (SUDs) will underreport substance use, data from these studies generally have shown self-reports of substance use to be valid relative to urinalysis. Nevertheless, some individuals have positive urine results that are inconsistent with their self-reports (Magura et al., 1987; Myrick et al., 2002). Since clinicians and researchers working with SUD patients often rely heavily on patient self-reports of substance use to track progress, identifying patient characteristics associated with denial of substance use would be useful to assist decision-making regarding the need for objective confirmation of self-report data.

Research comparing SUD patients who deny their substance use to those who never deny using is limited. While those who deny substance use are generally similar to those who admit to use, one study of adults dependent on cocaine found those who underreported cocaine use to be more likely to be employed (Myrick, Henderson, Dansky, Pelic, & Brady, 2002). A study of opioid-dependent adults found that those who underreported substance use were less likely to be dependent on amphetamine or cocaine (Rutherford, Cacciola, Alterman, McKay, & Cook, 2000). In a young adult opioid-dependent sample (mean age=19.7 years), no background or clinical differences were associated with denial of opioid use (Wilcox, Bogenschutz, Nakazawa, & Woody, 2013).

Little is known about the validity of substance use self-reports among patients with prescription opioid dependence. In recent years, prescription opioid use disorders have become widespread (Substance Abuse and Mental Health Services Administration, 2013). Because those dependent on prescription opioids have been shown to differ from those dependent on heroin with respect to some sociodemographic and clinical characteristics and treatment outcomes (Moore et al., 2007; Sigmon, 2006), factors associated with denial of substance use may also differ in this population. In particular, those dependent upon prescription opioids have a high prevalence of chronic pain; patients seeking treatment for chronic pain have been found to underreport opioid and other substance use (Fishbain, Cutler, Rosomoff, & Rosomoff, 1999; Katz et al., 2003).

The current study examined data from the Prescription Opioid Addiction Treatment Study (Weiss et al., 2011), a large, multi-site randomized clinical trial of varying combinations of buprenorphine-naloxone and counseling for prescription opioid dependence. The aim of this exploratory secondary analysis was to determine the prevalence, patterns, and characteristics of denial of urine-confirmed opioid use.

Methods

The data reported here were collected as part of the Prescription Opioid Addiction Treatment Study (POATS), a randomized clinical trial (N=653) conducted at ten sites across the United States under the auspices of the National Drug Abuse Treatment Clinical Trials Network. POATS used a two-phase adaptive treatment research design; in Phase 1, participants received 2 weeks of buprenorphine-naloxone stabilization, followed by a 2-week taper and 8 weeks of follow-up. Participants who abstained or nearly abstained from opioids in Phase 1 completed the study successfully; those who relapsed to opioid use

during Phase 1 were invited to enter Phase 2, which consisted of 12 weeks of buprenorphine-naloxone stabilization, followed by a 4-week taper and 8 weeks of follow-up. In each phase, participants were randomly assigned to receive either 1) Standard Medical Management (SMM) alone or 2) SMM plus individual Opioid Dependence Counseling (ODC).

The primary outcome measure in the trial was success at the end of week 12 of Phase 2, defined as abstinence from opioids during the final week of buprenorphine-naloxone stabilization (week 12) and during at least 2 of the 3 previous weeks (weeks 9-11). Of the 360 participants who entered Phase 2, approximately half (49.2%) were successful at the end of the 12-week buprenorphine-naloxone treatment. A full description of POATS methods and main outcomes is reported elsewhere (Weiss et al., 2010; Weiss et al., 2011). The criteria for a successful outcome cover the last four weeks of buprenorphine-naloxone stabilization treatment in Phase 2 (weeks 9-12); because some of our analyses for this report would be confounded by including the 4-week period during which outcome was determined, the current secondary analysis was limited to the first 8 weeks of the 12-week treatment in Phase 2.

Study population

Participants were 18 years or older and met Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV; American Psychiatric Association, 2000) criteria for current dependence on prescription opioids. Potential participants were excluded if they used heroin on more than four days in the past month, had ever injected heroin, had a lifetime diagnosis of opioid dependence due to heroin use alone, required ongoing pain treatment with prescription opioids, or were currently participating in formal SUD treatment other than self-help groups (see Weiss et al., 2010 for details). Of the 653 participants enrolled in Phase 1, 360 entered Phase 2. The current study of self-report validity focuses on the 360 participants enrolled in Phase 2, since the longer duration of Phase 2 offered far more data points to compare self-reports and urine results over time; in addition, length of participation in Phase 1 was inconsistent across patients, depending on when they relapsed to opioid use and thus were finished with Phase 1.

Treatments

Participants received sublingual buprenorphine-naloxone at each weekly SMM visit, with doses ranging from 8-32 mg/day during stabilization. SMM was medically-oriented addiction counseling delivered to all participants by a physician. In addition, half of the participants were randomly assigned to receive individual ODC by trained substance abuse or mental health professionals. ODC sessions consisted of educational skills training modules on addiction, recovery, and relapse prevention. (See Weiss et al., 2010 for further details about treatment and visit schedules.)

Assessments

Participants completed a series of assessments at baseline and throughout the study. Sociodemographic and clinical data reported here were collected at baseline. Opioid use data (self-reports and urine tests) were collected at baseline and during weekly visits.

The *Composite International Diagnostic Interview* (CIDI; World Health Organization, 1997) was administered at baseline to diagnose SUDs, major depressive disorder, and posttraumatic stress disorder (PTSD). *The Pain and Opiate Analgesic Use History* (Weiss et al., 2010) is a self-report measure developed for this study to assess opioid use history and pain. Opioid craving was assessed with the 3-item, self-rated *Craving Scale*, adapted from the Cocaine Craving Scale (Weiss et al., 2003). The *Addiction Severity Index-Lite* (ASI; McLellan et al., 1992) is a semi-structured interview that measures severity of substance use and related problems. The *Beck Depression Inventory II* (BDI; Beck, Steer, & Brown, 1996) is a 21-item self-rated scale used to measure severity of depressive symptoms. The *Fagerstrom Test for Nicotine Dependence* (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991) is a 6-item measure of severity of nicotine dependence. Daily opioid use was assessed weekly during treatment using the *Substance Use Report* (SUR), a self-report measure that uses a calendar technique similar to the Timeline Follow-back (Sobell & Sobell, 1992) to facilitate recall.

The SUR was corroborated at each weekly visit by *urine drug screens* and was used as the primary outcome measure to determine successful outcome (defined above) at the end of Phase 2 treatment. Urine samples were screened with the iScreen 9-panel dipstick test for the following opioids, selected for their common use: methadone, oxycodone, propoxyphene, and the Opiate 300 analytes group (morphine, heroin, and codeine), via a qualitative lateral flow chromatographic immunoassay test. The cutoff level for detection was 300 ng/mL for all opioids except oxycodone (100ng/mL). Agreement between the iScreen test and gas chromatography/ mass spectrometry is 99% for methadone and opiate 300, 98% for oxycodone, and 94% for propoxyphene (which no participants reported as their primarily used opioid). Negative agreement is 94% for methadone and opiate 300, 97% for oxycodine, and 99% for propoxyphene. We did not test for buprenorphine during this time period because it was being prescribed, and we would gain little information (other than complete absence of this medication from the urine) from this test. Consistent with best practices to maximize accurate self-report, participants were assured that urinalysis results would be confidential, were encouraged to be honest in their self-reports, and were made aware that weekly urine samples would be collected for drug testing and that reporting substance use would not affect their study participation (Del Boca & Noll, 2000; Weiss et al., 1998). Results of the urine sample were reviewed with the patient at the next weekly visit; urine results discordant with the previous week's self-report were discussed.

Data analysis

The current analysis focuses on the subset of participants enrolled in Phase 2 (N=360) who used opioids (n=246) during the first 8 weeks of the 12-week treatment according to their self-reports and/or urine results. Participants who were abstinent throughout treatment (n=77) did not have an opportunity to deny use and thus were excluded from the analysis. Participants (n=37) were also excluded if they never denied urine-confirmed opioid use, but more than half of their opioid use data were missing; these participants had too little self-report data to allow for meaningful analysis of patterns of denial and reporting of use.

Denial of use was defined as the presence of a positive urine test for opioids during a week in which no opioid use was reported on the self-report measure. Participants who reported opioid use and never denied use when a urine test was positive were categorized as never denying use.

Bivariate analyses compared participants who denied urine-confirmed opioid use at least once during the first 8 weeks of treatment with those who never denied opioid use. Dichotomous variables were assessed with chi-square tests, and continuous variables with independent samples *t*-tests or Mann-Whitney U tests if distributions were skewed. These analyses were used to provide unadjusted estimates of association and to screen for potential predictors for the multivariable analysis. Second, a multivariable logistic regression model assessed the relative contribution of baseline characteristics when examined simultaneously. Variables with bivariate associations at a significance level of p 0.10 were included in multivariable analyses; a liberal criterion of p< 0.10 was used to avoid overlooking negatively confounded variables. These two stages of the analysis allow comparison of adjusted and unadjusted estimates, while providing strong control over confounding. With potential overlap between certain baseline characteristics, multicollinearity might be an issue in the logistic regression model; this was assessed by examination of tolerance (using a cutoff of <0.1) and variance inflation factors (using a cutoff of >10.0); no variables exceeded acceptable limits.

Results

Sample characteristics

Of the 360 participants who entered Phase 2, most (90.6%) were white and 41.9% were female. The mean age was 32.5 (sd=9.7), and the mean number of years of education was 12.9 (sd=2.2). Most participants (60.3%) were employed full-time, and 50.0% were never married. About a quarter (27.8%) reported any lifetime heroin use, and 41.4% reported chronic pain at baseline. Most participants (64.7%) reported initially using opioids to relieve physical pain, and 28.6% first used opioids to get high. Just over one-third of the sample (34.2%) were diagnosed with lifetime major depressive disorder, and 18.5% (N=66/357) had lifetime posttraumatic stress disorder.

Agreement between self-report of opioid use and urinalysis (N=360 participants)

Overall, 88.4% (2,546) of the 2,880 possible self-report and urine drug screen data (360 participants × 8 possible weeks) were collected. Self-reports and urine drug screens were consistent in 87.3% of these instances (Table 1). Among the 12.7% of inconsistent reports, just over half were self-reports of opioid use undetected by urinalysis; 5.9% of all reports involved participants who denied opioid use that was detected by a urine drug test.

Overall, 30.3% of participants (n=109) used opioids and denied it at least once, 38.1% (n=137) used opioids and never denied it, and 21.4% (n=77) abstained from opioid use according to both self-report and urine tests; 10.3% (n=37) were excluded from subsequent analyses due to too much missing data (see above). When we eliminate the latter two groups

and focus exclusively on those who used opioids, 44.3% of the 246 participants who used opioids (n=109) denied use at some point.

Patterns of denying urine-confirmed opioid use (n=246)

The remaining analysis is limited to the 246 participants who used opioids during the trial, as determined by positive self-report and/or urine drug screen. The 246 opioid users and the 114 excluded participants who either abstained from opioids completely or had too much missing data were not significantly different on sociodemographic characteristics (gender, race, education, marital status, and employment), with one exception; those included in the analyses below were younger (mean age=31.8 vs. 34.2 years; p<0.05).

Examination of urinalysis in the 246 participants who used opioids during the trial showed that 22.9% of positive urinalysis results (149/650) were denied by participants. Among these 246 participants who used opioids according to self-report and/or urine drug screen, 25.2% (n=62) used opioids in only one of the 8 weeks, 29.3% (n=72) used in 2 or 3 weeks, 38.6% (n=95) used in 4-7 weeks, and 6.9% (n=17) used in all 8 weeks. Of the 109 participants who ever denied using opioids when they had a positive urine test, the majority did so in only one of the 8 weeks (78.0%, n=85), 17.4% (n=19) denied use in 2-3 weeks, and 4.6% (n=5) denied use in 4-7 weeks. Participants who denied use only once did not differ from those who denied use more than once on sociodemographic characteristics. Among the 109 participants who ever denied using opioids, most (81.7%, n=89) reported use at other times; 17.4% (n=19) denied use only once and were abstinent (according to both self-report and urine testing) the rest of the time; and the remaining participant denied urine-confirmed opioid use on every occasion of opioid use.

Patterns of reporting opioid use over time were examined among participants who ever denied use (n=109). Participants were as likely to report use first and deny use subsequently as to deny use first and report use subsequently: 42.2% (n=46) vs. 39.4% (n=43), respectively. Alternating between accurately reporting opioid use and denying opioid use was common in this study sample (n=38, 34.9%).

Characteristics of those who denied urine-confirmed opioid use: Bivariate analysis

Participants who denied using opioids at the same visit as a positive urine test (n=109) were compared to those who never denied opioid use (n=137) on sociodemographic characteristics, substance use history, and other clinical characteristics at baseline, treatment condition, and treatment outcome (Table 2). Those who denied opioid use were older than those who did not (t(246)=2.05, p<0.05). Participants did not differ on the remaining sociodemographic characteristics (gender, race, education, marital status, and employment).

Participants whose first source of opioids was a legitimate medical prescription were more likely to deny opioid use (χ^2(1)=4.66, p<0.05), and those whose first source of opioids was receipt from someone other than a physician were less likely to deny use (χ^2(1)=5.42, p<.05). Participants who first used opioids to relieve physical pain were more likely to deny opioid use (χ^2(1)=7.53, p<0.01), and participants who first used opioids to get high were less likely to deny use (χ^2(1)=4.54, p<0.05). Participants who denied use had more severe ASI

medical composite scores (t(242)=2.08, p<0.05) and were more likely to report a diagnosis of past-year major depressive disorder (χ^2(1)=4.75, p<0.05). Treatment condition and successful opioid use outcome were not associated with denying or reporting use.

Predictors of denying opioid use: Multivariable analysis

A multivariable logistic regression model was examined using the baseline variables with p values   0.10 in the bivariate analyses (Table 3). The overall model was significant (χ^2(8)=22.64, p<0.005; R^2=12.3%; n=235). One baseline variable remained significant, controlling for all other variables: participants who initially used opioids to relieve pain were more likely to deny opioid use than those who initially used opioids for other reasons (OR=2.47, 95% CI=1.05-5.80, p<0.05).

Discussion

In this sample of participants with prescription opioid dependence, only 5.9% of all self-reports involved denial of opioid use that was detected by urinalysis. One reason for this low percentage, however, was the high rate of negative urine tests: only 26% of all urine tests were positive for opioids. When we examined the rate of denial of use in the context of a positive urine test, we found that opioid use was denied for 22.9% of all positive urine tests, and nearly half (44.3%) of the study participants who used opioids denied use at some point during the trial. Approximately one-third of the total sample (including those who abstained from opioids completely) ever denied urine-confirmed opioid use, and most of the participants who denied use (78.0%) did so only once. Participants were as likely to deny opioid use before reporting use later as they were to report opioid use earlier and then deny use; many participants alternated between reporting and denying use in different weeks. Multivariable analysis showed that only a history of initially using opioids to relieve pain was significantly associated with denying opioid use, when controlling for other potential correlates.

The prevalence of underreporting of substance use is quite variable in the literature. For example, Weiss and colleagues (1998) found that 4.7% of all reports involved denial of substance use among outpatients dually diagnosed with substance use disorder and either PTSD or bipolar disorder, compared to 15.6% of reports among opioid dependent patients in a study by Rutherford and colleagues (2000). Among reports limited to positive urines, both of these studies found higher percentages of denials than our study: 27.7% (Weiss et al., 1998) and 38.4% (Rutherford et al., 2000), respectively. The prevalence of participants who denied opioid use in our study (30.3%) is intermediate between other reports: 18.2% among dually diagnosed patients (Weiss et al., 1998), 24.7% among opioid dependent patients (Rutherford et al., 2000), and 58% among cocaine dependent patients in a study by Myrick et al. (2002). However, comparing rates across these studies is problematic, given the variation in (a) number of data points per patient, which affects the number of opportunities to report substance use (from 3 in Rutherford et al., 2000, to 12 in Myrick et al., 2002), (b) number of substances assessed, (c) whether or not denial of a single positive urine test is considered underreporting, (d) whether or not a self-report of substance use in the absence of

a positive urine test is considered to be admitting drug use, and (e) how missing data are handled.

In the current sample, most participants who denied opioid use did so only once, consistent with other studies (Rutherford et al., 2000; Weiss et al., 1998), and few individuals repeatedly denied substance use. Participants who denied use only once and subsequently reported use may have later reported more accurately because they observed that there were no negative consequences for drug use when the results of their urinalysis were discussed at the next visit. This change in the accuracy of reporting may also have been affected by variation over time in individual factors such as craving or feelings of shame. Studies have consistently shown that self-reports of substance use are most likely to be valid when participants believe that they will not suffer negative consequences (e.g., discharge from treatment or report to a probation officer) as a result (Del Boca & Noll, 2000; Solbergsdottir et al., 2004; Weiss et al., 1998). Participants who repeatedly denied opioid use or who denied use after having reported opioid use without negative consequences may have continued to misrepresent their use because of more subtle consequences (e.g., appearing less favorable to research staff) or other reasons (e.g., personal legal ramifications). It is possible that such considerations influenced the variability of accurate reporting in this population.

Results of the baseline characteristics of those denying opioid use should be interpreted with caution, as most of the participant characteristics that were moderately significant predictors in the bivariate analyses were no longer significant in the multivariable analysis. Initially using opioids to relieve pain was the only predictor associated with denying opioid use in the multivariable analysis. Receiving opioids initially via a medical prescription and initial use of opioids to relieve pain are characteristics specific to prescription opioid users and have thus not been studied in previous literature. It is notable that the only characteristic that distinguished between those who denied use and those who never denied opioid use is one that is unique to this population. More than half of the participants (57.0%) who denied opioid use and first used opioids to relieve pain also reported current chronic pain at baseline, but current chronic pain was not itself a predictor of denial of use. Patients who have received opioids for chronic pain in the past may be particularly inclined to misrepresent their opioid use if they have experienced negative consequences of aberrant opioid use in the past. Indeed, in some such cases, the prescribing physician may reduce or discontinue opioid treatment (Chelminski et al., 2005; Hariharan, Lamb, & Neuner, 2007; Sekhon, Aminjavahery, Davis, Roswarski, & Robinette, 2013).

There are several limitations to the current study. First, urine testing has an opioid detection window of 1-3 days after the last use (Cone & Preston, 2002); therefore, urine tests may not have detected unreported opioid use that occurred earlier in the week. This limited window can explain why some participants' self-reported opioid use was not detected by urine tests. It is also possible that those who were excluded because of too much missing data may have been heavy drug users and may have been less likely to adhere to all study procedures, including accurate self-reporting. There may also have been other patient characteristics that were not assessed here but could be associated with denying opioid use. Findings may not be generalizable to prescription opioid dependent patients with significant heroin use,

because individuals with regular heroin use were excluded from the study. The study population was primarily white, and 60% were employed full-time; thus, the results may not apply to non-whites, or those whose opioid use disorder is so severe that they are incapable of working full-time. The time frame for recall of opioid use was limited to one week, so recall bias is unlikely but cannot be ruled out.

Finally, we performed qualitative immunoassay tests, which can yield some false-positive results, albeit less than 2% for all drugs except the rarely-used propoxyphene. Some self-reports categorized as denial of use may have been accurate. It is also possible that participants who initially received opioids for pain may have been more medically ill and thus taken medications that might produce false-positive urine tests for opioids. Similarly, false-negative tests may have led us to categorize a small number of actual instances of denial of use as accurate. Because of the high rate of positive and negative agreement between our testing procedure and the gold-standard gas chromatography/mass spectrometry , our overall results are unlikely to have been substantially affected.

The present study shows that, although the clear majority of self-reports were consistent with urine results, many participants denied urine-confirmed use, albeit infrequently. This result, combined with the finding that 7% of the positive self-reports were provided in a week with a negative urine test, shows the importance of obtaining both self-report data and urine tests; neither one alone is adequate. It is notable that such a large percentage of participants denied opioid use although they knew that urine testing was being performed and would likely reveal their use; it is quite possible that the rate of denial of use would be higher in the absence of urine testing.

The majority of participants who denied opioid use did so only once, and 99% of those who used opioids more than once and denied use at some point reported use at other times. No clear markers emerged for distinguishing between "honest" and "dishonest" patients. Rather, many patients are honest at some times and not at others. Nevertheless, our findings suggest that, within a treatment-seeking prescription opioid dependent sample, participants who first used opioids to relieve pain were somewhat more likely to deny their opioid use.

The conditions under which data are collected are also important to consider, including making participants aware that urine samples will be collected, assuring confidentiality, encouraging honest self-reports, and informing patients that there will be no negative consequences for reporting substance use. Even when these conditions are considered, however, occasional misrepresentation of self-reported use will occur among a substantial minority of prescription opioid dependent participants.

Acknowledgments

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Highlights

1. We studied self-reports of opioid use and urine tests in patients with prescription opioid dependence

2. Among those who used, nearly half denied urine-confirmed use, typically just once.

3. Those originally prescribed opioids for pain were more likely to deny use.

4. Use of both self-reports and urine testing is optimal in this population.

Table 1

Agreement between self-reports and urinalysis for opioid use during Phase 2, Weeks 1-8 (N=2546 urinalysis reports for 360 participants)

Opioid use		Urinalysis results	
		+	−
Self-report	+	20.1%	6.8%
	−	5.9	67.2

Table 2

Baseline characteristics of participants who denied vs. never denied opioid use, Weeks 1-8 (n=246 who used opioids)

Participant characteristics	Denied use (n=109)	Never denied use (n=137)
Treatment condition		
SMM + opioid drug counseling, %	50.5	46.7
Sociodemographics		
Female, %	49.5	40.9
White race, %	89.0	89.8
Age, mean (sd)	33.1 (9.8)	30.7 (8.7)[*]
Education, mean years (sd)	13.0 (2.2)	12.7 (1.8)
Never married, %	47.7	57.7
Employed full-time, %	62.4	58.4
Substance use		
Any non-opioid substance dependence diagnosis, %		
Past year	18.3	13.1
Lifetime	48.6	48.2
Opioid use history		
Ever used route other than swallowing/sublingually, %	83.5	89.8
4 years or more of opioid use, %	47.7	47.1
First source of opioids, %		
Medical prescription	60.6	46.7[*]
Substance use		
Opioid use history		
First source of opioids, %		
Given by someone	18.3	31.4[*]
Dealer	9.2	10.9
Reason for first opioid use, %		
To relieve pain	72.5	55.5[**]
To get high/For euphoria	22.0	34.3[*]
Used extended-release oxycodone most often, past 30 days, %	33.0	40.1
Ever used heroin prior to baseline, %	32.1	29.9
Craving scale, mean (sd)	8.1 (2.3)	7.8 (2.0)
Prior opioid use disorder treatment, %	32.1	38.7
Goal of total opioid abstinence, %	55.0	59.9
Other		
ASI composite score[a], mean (sd)		
Alcohol use	.04 (.07)	.05 (.11)
Drug use	.34 (.07)	.33 (.07)
Legal	.06 (.15)	05 (.12)

Participant characteristics	Denied use (n=109)	Never denied use (n=137)
Medical	.25 (.34)	.17 (.29) *
Psychiatric	.18 (.22)	.12 (.15) †
Substance use		
Other		
ASI composite score[a], mean (sd)		
Employment	.40 (.29)	.39 (.31)
Family/Social	.18 (.22)	.15 (.22)
Fagerstrom nicotine dependence score, mean (sd)	3.8 (2.9)	3.3 (2.8)
Clinical		
Depression		
Past year, %	22.9	12.4 *
Lifetime, %	36.7	30.7
Beck Depression Inventory score, mean (sd)	24.1 (12.8)	22.9 (12.1)
Lifetime posttraumatic stress disorder, %	22.9	14.6 †
Current chronic pain, %	45.9	34.3 †

† $p<0.10$

* $p<0.05$

** $p<0.01$

[a] Due to some missing data for the Addiction Severity Index (ASI) composite scores, available samples sizes were n=225 (alcohol use), n=246 (drug use), n=227 (legal), n=242 (medical), n=238 (psychiatric), n=242 (employment), n=219 (family/social).

Table 3

Logistic regression model for predictors of denying opioid use Weeks 1-8 (N=235)

Baseline variables	Odds ratio	95% CI	p
Age	1.02	0.99-1.05	0.16
First source of opioids was medical prescription	0.70	0.31-1.57	0.39
Reason for first opioid use was to relieve pain	2.47	1.05-5.80	0.04
Addiction Severity Index			
Medical	1.63	0.61-4.35	0.33
Psychiatric	3.69	0.72-19.01	0.12
Past year depression	1.81	0.82-4.00	0.14
Lifetime posttraumatic stress disorder	1.35	0.66-2.76	0.42
Current chronic pain	1.00	0.53-1.88	0.99