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## Treatment Compliance in Patients with Comorbid Psychiatric and Substance Use Disorders

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### Abstract

This study examines clinical and non-clinical factors associated with treatment compliance problems in 342 patients with substance use disorders (SUD) seen in routine psychiatric practice. Weighted Wald- $X^2$  and multivariate logistic regression assessed sociodemographic, clinical, treatment, and health plan characteristics associated with treatment compliance problems. Among patients with SUD, 40.5% were reported to currently have treatment compliance problems. Patients with treatment compliance problems were significantly more likely to have personality disorders, lower global assessment of functioning scores, and medication side effects than those without treatment compliance problems. Patients seen by psychiatrists who were reimbursed by discounted rather than undiscounted fee-for-service were five times more likely to be reported to have treatment compliance problems. Both clinical and non-clinical factors appear to be associated with treatment compliance problems. Understanding these factors and targeting treatment interventions may improve treatment compliance and patient outcomes.

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It is estimated that half of the patients with chronic medical or psychiatric disorders do not receive the full benefit of prescribed treatment regimens because of medication compliance problems.<sup>1</sup> While transient or partial compliance may be expected for most patients at some point during their course of treatment, among patients with psychiatric disorders, continuous non-compliance to prescribed medications and other therapies is a major contributing factor to symptom relapse and re-hospitalization.<sup>2,3</sup> Adherence with psychiatric treatment may be further complicated when comorbid substance use disorders (SUD) are present. Psychiatric patients with SUD tend to be less likely to adhere to treatment and have poorer outcomes than psychiatric patients without SUD.<sup>4-6</sup>

Numerous demographic and clinical factors have been found to contribute towards SUD patients' willingness or ability to adhere to treatment. Demographic measures associated with treatment compliance and retention include employment, race, gender, age, and education.<sup>7-13</sup> Specifically, older, non-Hispanic white, employed, male patients with more years of

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education and stable housing were most likely to participate in treatment for SUD.<sup>13</sup> Clinical factors associated with poor treatment compliance in patients with SUD include psychiatric comorbidity,<sup>14-16</sup> severe psychiatric impairment and early onset of illness,<sup>14,17,18</sup> cognitive impairment,<sup>19</sup> and social isolation/poor social support.<sup>9,20,21</sup> Other factors include medication side effects, organizational and financing issues (eg, a lack of integrated services for patients with co-occurring mental disorders and SUD<sup>22</sup>), attitudes and beliefs about a particular treatment, and awareness of illness.<sup>23</sup>

Various methods have been explored to increase patient compliance with treatment. Motivational interviewing,<sup>24</sup> contingency management techniques and community reinforcement,<sup>25,26</sup> assertive community treatment,<sup>27</sup> medication supervision in residential programs,<sup>28</sup> financial incentives for the patient,<sup>29,30</sup> and use of naltrexone and other anti-craving medications<sup>31</sup> have all been associated with patients' increased compliance with treatment. Mandatory outpatient commitment has been proposed as a useful intervention for a subset of patients with severe and chronic mental illness who are repeatedly hospitalized,<sup>32</sup> resulting in important resource implications. For example, patients who did not keep their outpatient follow-up appointments after hospital discharge were twice as likely to be re-hospitalized in the same year as patients who kept at least one follow-up appointment.<sup>3</sup>

Although previous findings provide important information about factors that may affect treatment compliance in patients with SUD, most of these data were obtained from treatment research studies and/or at a particular site. Currently, little is known about factors associated with treatment adherence for SUD patients in routine clinical practice. The purpose of this study is to characterize demographic, clinical, treatment, and health plan factors related to treatment compliance in a national sample of patients with SUD treated by psychiatrists in routine clinical practice. Describing and characterizing patients at highest risk for poor compliance may help inform and target treatment compliance strategies and services to improve treatment outcomes for this population. Treatment research investigators may also benefit from this information when designing initiatives to improve treatment compliance.

## METHODS

We use data from the American Psychiatric Institute for Research and Education (APIRE) Practice Research Network's (PRN) *1999 Study of Psychiatric Patients and Treatments* (SPPT). Pincus et al.<sup>33</sup> provide a detailed description of the methods and implementation of the 1997 SPPT. The PRN consists of 784 psychiatrists who were members of the American Psychiatric Association and spent at least fifteen hours/week in direct patient care. Forty-eight percent (n = 378) were randomly selected and recruited from the APA membership to ensure a representative sample across public and private, inpatient and outpatient settings; the remainder were self-selected volunteers obtained through nationwide recruitment. The response rate was 78% (N = 615).

Participating psychiatrists completed a questionnaire on a randomly assigned start day and time, providing clinical data on three patients from their caseload who had been systematically pre-selected. Psychiatrists provided detailed demographic and clinical data on 1,843 patients. There were 342 (20%) patients diagnosed with a primary or comorbid DSM-IV alcohol or substance use disorder, excluding nicotine dependence. SUD was listed as the primary disorder for 17% (n = 57) of the SUD patient sample. Nearly all SUD patients (97.6%) were reported to have a non-SUD psychiatric disorder.

To assess treatment compliance, psychiatrists were asked, "Is the patient currently experiencing treatment compliance problems?" Selection options were yes, no, or don't know. The following general definition was intended to apply across patients with different types of psychiatric

disorders, and was provided in a separate glossary attached to the survey: “Treatment compliance problems refer to problems with medication compliance, missing scheduled appointments, failure to complete behavior therapy assignments and similar difficulties.”

Sampling weights were created to generate nationally representative estimates. The weight adjusts for discrepancies between the random and volunteer samples along with discrepancies between the psychiatrists in the PRN (including both random and volunteer members) and non-PRN APA members. The weight also accounts for the probability of a patient being selected into the study based on a psychiatrist caseload.

All analyses use the SUDAAN software package to accommodate the complex sampling design of the SPPT and the sampling weights. Cross-tabulations and design-based significance tests (Wald chi-square tests for categorical variables and Wald F tests for continuous variables) were conducted to assess whether there were demographic, clinical, treatment, and health plan differences among SUD patients with current treatment compliance problems as compared to those without such problems. Multivariate stepwise logistic regression analyses were performed to assess which factors were most strongly associated with current treatment compliance problems in patients with SUD while controlling for other relevant factors.

## RESULTS

Psychiatrists reported that 40.5% ( $n = 128$ ) of their patients with SUD had treatment compliance problems. The rate of current treatment compliance problems for patients with SUD was significantly higher than the rate for patients with depression (15.1%) or anxiety disorders (16.3%), but comparable for patients with schizophrenia (40.5%) or bipolar (32.3%) disorder.

### Sociodemographic Characteristics

No statistically significant differences in rates of treatment compliance problems were observed by race/ethnicity, marital status, age, or education level (see Table 1). Rates of treatment compliance problems were significantly higher among patients who were unemployed due to a mental or physical disability (53.6%) or other reasons (62.9%) as compared to those who were employed (27.9%,  $p < .01$ ). Although not statistically significant, nearly half (48.2%) the female patients were reported to have current treatment compliance problems, compared to one-third (34.7%) of male patients.

### Clinical Characteristics

As indicated in Table 2, no statistically significant differences in rates of treatment compliance problems were observed by Axis I diagnosis; 48.8% of patients with schizophrenia, 37.8% of patients with mood disorders, and 27.8% of patients with anxiety disorders were reported to have current treatment compliance problems. Regarding Axis II disorders, 56.1% of patients with personality disorders were reported to have treatment compliance problems, compared to 33.6% of those without personality disorders ( $p < .01$ ).

Treatment compliance problems were also associated with specific Axis IV psychosocial problems. As shown in Table 2, higher rates of treatment compliance problems were associated with problems with patients' social environment, housing, poverty, and criminal/legal involvement. More than half (56.4%) of the patients with global assessment of functioning (GAF) scores of 50 or below were reported to have treatment compliance problems, compared to 26.9% of those with GAF scores between 51–70, or 19.5% of those with GAF scores above 70 ( $p < .001$ ). Patients with moderate/severe psychotic symptoms had significantly higher rates of treatment compliance problems compared to those with mild or no psychotic symptoms (see Table 2).

Treatment compliance problems were significantly associated with patients' social functioning: as social functioning worsens, rates of treatment compliance problems progressively increase (see Table 2). More than half of the patients with medication side effects were reported to have treatment compliance problems, compared to about a third of patients without side effects (56.3% vs. 34.8%;  $p < .05$ ). As indicated in Table 2, patients currently experiencing other clinical problems such as illicit drug use, alcohol use, and disomnias had significantly higher rates of treatment compliance problems than those without these clinical problems.

### Treatment Characteristics

Treatment compliance was associated with receiving care in an inpatient setting, as 63.9% of inpatients were reported to have treatment compliance problems, compared to 31.5% of outpatients ( $p < .001$ , Table 3). Rates of treatment compliance problems were not associated with the number or type of medications prescribed or rates of recent (past thirty days) participation in psychotherapy (see Table 3). Poor treatment compliance was associated with the use of outpatient crisis-related treatment; nearly three-fourths (71.8%) of patients receiving crisis intervention in the past thirty days were reported to have treatment compliance problems, compared to 37.2% of patients not receiving outpatient crisis services ( $p < .01$ ). The average duration of treatment with the reporting psychiatrist was almost twice as long for patients without treatment compliance problems as compared to those reported to have compliance problems (29.8 months and 15.5 months, respectively,  $p < .001$ ).

### Health Plan Characteristics

As shown in Table 4, there were no treatment compliance group differences in health insurance status (insured versus uninsured) or type of insurance coverage (managed versus non-managed care). Rates of treatment compliance problems were similar for patients who used public (47.1%) or private (42.3%) insurance, but only 20.7% of self-pay patients had treatment compliance problems ( $p < .05$ ). Half the patients whose treatment was subject to utilization review were reported to have treatment compliance problems, compared to one-third of those whose treatment was not subject to utilization review (49.0% vs. 33.5%;  $p < .05$ ). Patients of psychiatrists who were reimbursed by discounted fee-for-service or salary rather than undiscounted fee for service were more likely to report treatment compliance problems among their patients.

Additional analysis of psychiatrist reimbursement and sources of payment indicate that among those reimbursed by fee-for-service, psychiatrists were more likely to be reimbursed at discounted rates when treating patients who pay for their visit with Medicaid (78.7%), Medicare (88.2%), or private insurance (72.7%); only 26.4% of psychiatrists were reimbursed at discounted rates when treating self-pay patients and 23.7% when treating patients who paid for their visit with government sources other than Medicaid or Medicare ( $p < .001$ ). Analysis of time spent with patients indicates that psychiatrists reimbursed at discounted rates saw their patients for 33 minutes on average, compared to 40 minutes for psychiatrists reimbursed at undiscounted rates ( $p < .05$ ).

### Variables Most Strongly Associated with Treatment Compliance Problems

Stepwise logistic regression was used to identify patient demographic, clinical, treatment, and health plan variables that had significant associations with current treatment compliance problems (see Table 5). The following clinical variables were most strongly associated with an increased likelihood of having treatment compliance problems: a comorbid personality disorder (OR 2.6; 95% CI = 1.3, 5.5), global assessment of functioning score below 50 (OR 3.6; 95% CI = 1.8, 7.4), current illicit drug problem (OR 4.0; 95% CI = 2.1, 7.8), and medication side effects (OR 2.5; 95% CI = 1.4, 4.6). Related to health system factors, patients treated by

psychiatrists reimbursed by discounted fee-for-service were over five times more likely to experience treatment compliance problems than patients treated by psychiatrists reimbursed through undiscounted fee-for-service (OR 5.4; 95% CI = 1.5, 19.6); patients whose psychiatrists were reimbursed by salary were three times more likely to experience treatment compliance problems than patients treated by psychiatrists reimbursed by undiscounted fee-for-service (OR 3.0; 95% CI = 1.0, 9.2).

## DISCUSSION

A national sample of psychiatrists reported that two out of five psychiatric patients with SUD were currently experiencing treatment compliance problems. Clinical and health plan factors were strongly associated with treatment compliance problems, while most demographic and treatment factors were not found to be associated with treatment compliance problems.

These study data suggest that treatment compliance problems are associated with severe clinical and functional impairments, as evidenced by the greater likelihood of treatment compliance problems among patients with lower GAF scores. While non-compliance may result in greater clinical impairment, this association may also indicate that more severely impaired patients have greater difficulty complying with treatment. A myriad of complex psychosocial problems, including housing, economic, and crime/legal system problems associated with treatment compliance, underscore the need to more effectively combine psychiatric, psychosocial, and substance abuse treatment. SUD patients with treatment compliance problems may benefit from more intensive SUD treatment and ancillary support that address specific barriers to treatment compliance, such as support with housing, social skills, and vocational/employment training issues.

Another important distinction between patients with and without treatment compliance problems is that patients with treatment compliance problems were in treatment with the reporting psychiatrist for less than half the number of months, on average, as patients without treatment compliance problems. Patients with SUD may experience treatment compliance problems earlier in the course of their treatment, that may result in the early termination of treatment. The high proportion of SUD patients with treatment compliance problems may present a particular challenge to clinicians in establishing a therapeutic alliance and retaining these patients in treatment. Creative strategies for engaging patients with SUD in treatment, such as motivational interviewing<sup>24</sup> and assertive community treatment,<sup>27</sup> have demonstrated success.

No statistically significant differences were observed regarding the type or number of medications prescribed. Future analyses of specific types of medications (eg, atypical versus traditional antipsychotic medications), dosage (eg, high versus low dose, frequency of dosing), and frequency of patient monitoring/psychiatric management may provide additional useful information related to the characteristics of patients who are more likely to experience treatment compliance problems.

Both inpatient- and crisis-oriented services that result in a higher cost of care are correlated with current treatment compliance problems. These findings suggest that patients' inability to achieve drug abstinence (ie, episodes of relapse) may contribute to poor overall treatment compliance and higher overall utilization and costs of care. Given that substance use disorders are chronic disorders, initiating compliance strategies during inpatient treatment (eg, use of depot medication, linkage to assertive community treatment) and continuing long-term support after discharge may be necessary for many patients. Medication side effects were also associated with treatment compliance problems, indicating the importance of identifying and

managing side effects early in the treatment process and the need for ongoing monitoring of side effects.

Analyses of health care system factors (eg, source of payment, psychiatrist reimbursement mechanism) indicate that patients with treatment compliance problems may have fewer resources and more limited access to treatment, as evidenced by their greater reliance on public sources of payment and likelihood of receiving treatments subject to utilization review. Psychiatrists who were reimbursed through discounted fee-for-service were over five times more likely than psychiatrists reimbursed through undiscounted fee-for-service to report their patients had treatment compliance problems, indicating psychiatrists receiving full payment may be better able to encourage compliance, as they had, on average, seven more minutes per session to spend with patients. Most psychiatrists treating Medicare and Medicaid fee-for-service patients discounted their rates, as did almost three-fourths of those treating privately insured patients, indicating a significant proportion of fee-for-service patients with comorbid psychiatric and substance use disorders may be at a higher risk of experiencing treatment compliance problems. Clinically complex patients who require more treatment services may be more likely to have treatment compliance problems and exhaust their health plan benefits and financial resources. Longitudinal research designs are needed to examine the potential effect of various financing and management techniques on patient selection/access to treatment, quality, outcomes, and cost of care.

Although not statistically significant, 48% of female patients experienced treatment compliance problems, compared to 35% of male patients, indicating that larger sample sizes may be needed to examine gender differences in treatment compliance for psychiatric patients with SUD. It is important that specific barriers to treatment compliance for women be identified (eg, lack of childcare, male-oriented SUD treatment programming) so that attention can be focused on effective strategies to address such barriers to care. This study did not replicate earlier findings indicating that young adults, unmarried, or racial/ethnic minority patients are more likely to experience treatment compliance problems compared to older adults, married, or non-Hispanic white patients.<sup>7-13</sup> Perhaps those sociodemographic factors are associated with treatment compliance in treatment research settings and not in routine psychiatric treatment.

### Study Limitations

Major limitations of this study include the use of cross-sectional data, in which response to treatment and outcomes were not tracked. The cross-sectional, observational design of the study did not permit assessment of whether the patients' increased rates of psychosocial problems, greater clinical complexity/severity, and fewer economic resources are causes or effects of current treatment non-compliance. For example, treatment compliance problems may be a marker for patients with greater severity or acuity of illness. Also, because patient information was psychiatrist-reported, the extent of under-detection of substance use disorders and treatment compliance problems is not known. The study did not provide specific information on the patient's type of treatment compliance problem (eg, missing appointments or refusal of medication) and did not ascertain the patient's perspective (eg, the patients' reasons for not complying with treatment). Additionally, there may have been ambiguity in how the psychiatrist interpreted "treatment compliance problems." For example, respondents may have considered problems abstaining from using alcohol or illicit substances as treatment compliance problems. The extent to which psychiatrists used evidence-based practices that have been demonstrated to improve patient compliance and retention, such as contingency management and motivational interviewing techniques, was not ascertained. Finally, sample sizes did not facilitate more meaningful statistical analyses across different patient subgroups

such as racial/ethnic minority patient groups. Larger sample sizes are needed to further study differences in treatment compliance by gender and race/ethnicity.

## CONCLUSIONS

The present study examined rates of current treatment compliance problems in a large national sample of patients with SUD across a range of “real world” psychiatric practice settings. Clinically detailed data examined both patient-level and system-level variables associated with treatment compliance, allowing for comparisons to be made across settings and comorbid diagnostic groups. Treatment compliance problems are highly prevalent in psychiatric patients with SUD. These data highlight the need for future strategies to improve treatment compliance to include SUD-related components, such as monitoring drug abstinence and assessing of relapse risk, as well as future research to examine psychiatrists’ use of evidence-based practices that improve treatment compliance. Addressing treatment compliance issues on a long-term basis from many different perspectives is a necessary component for effective mental health and integrated mental health/substance abuse treatment. Patients with severe clinical and psychosocial impairment and fewer economic resources were more likely to experience treatment compliance problems. Targeting these patient groups for interventions that support treatment compliance may improve patient outcomes.

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**TABLE 1**

Percentage of Patients with Treatment Compliance Problems by Demographic Characteristics

	% (95% CI)	$\chi^2$	df	<i>p</i>
Gender		3.4	1	0.0676
Male (n = 198)	34.7 (26.3–43.0)			
Female (n = 118)	48.2 (36.4–59.9)			
Race		3.4	3	0.3332
White (n = 230)	36.6 (27.8–45.4)			
Black (n = 51)	53.7 (35.7–71.1)			
Hispanic (n = 20)	43.1 (15.9–70.2)			
Other (n = 19)	58.1 (31.1–85.1)			
Marital status		2.1	2	0.5577
Married (n = 81)	35.6 (22.0–49.1)			
Divorced/separated (n = 98)	37.3 (25.5–49.1)			
Never married (n = 128)	46.8 (35.6–58.1)			
Age		4.6	2	0.2025
Age 18–35 (n = 104)	51.3 (39.1–63.5)			
Age 36–64 (n = 183)	35.0 (25.2–44.7)			
Age 65 or older (n = 16)	40.9 (20.4–61.3)			
Education		1.5	2	0.4816
<High school (n = 89)	46.8 (33.4–60.2)			
High school graduate (n = 106)	39.5 (27.3–51.6)			
>High school (n = 107)	36.0 (23.8–48.1)			
Employment status		15.8	3	<.01
Employed (n = 116)	27.9 (16.7–39.0)			
Unemployed due to:				
Disability (n = 136)	53.6 (43.1–64.1)			
Student/homemaker (n = 37)	24.4 (6.9–42.0)			
Other reasons (n = 22)	62.9 (42.7–83.0)			

TABLE 2

Percentage of Patients with Treatment Compliance Problems by Clinical Characteristics

	% (95% CI)	$\chi^2$	df	p
DSM-IV Diagnosis				
Schizophrenia		1.4	1	0.2321
Yes (n = 70)	48.8 (33.5–64.1)			
No (n = 251)	38.1 (29.4–46.8)			
Mood disorder		0.8	1	0.3701
Yes (n = 192)	37.8 (27.7–47.8)			
No (n = 129)	45.1 (33.3–56.9)			
Anxiety disorder		3.0	1	0.0817
Yes (n = 62)	27.8 (11.5–44.1)			
No (n = 259)	43.5 (35.5–51.4)			
Personality disorder		7.3	1	<.01
Yes (n = 93)	56.1 (43.2–69.1)			
No (n = 228)	33.6 (25.4–41.8)			
Axis IV psychosocial problems related to				
Social environment		7.6	1	<.01
Yes (n = 119)	53.7 (42.5–65.0)			
No (n = 202)	33.5 (24.9–42.2)			
Housing		6.8	1	<.01
Yes (n = 71)	57.7 (43.5–71.9)			
No (n = 250)	35.5 (27.5–43.6)			
Economic		5.4	1	<.05
Yes (n = 135)	49.7 (38.6–60.7)			
No (n = 186)	33.7 (25.3–42.2)			
Crime/legal system		4.4	1	<.05
Yes (n = 82)	51.7 (38.6–64.8)			
No (n = 239)	36.6 (28.3–45.0)			
GAF score		20.9	2	<.001
50 or below (n = 149)	56.4 (47.4–65.4)			
51–70 (n = 126)	26.9 (16.3–37.4)			
71 or above (n = 38)	19.5 (2.5–36.5)			
Psychotic symptoms		13.0	3	<.01
None (n = 208)	32.9 (23.8–42.0)			
Mild (n = 38)	45.3 (24.1–66.4)			
Moderate (n = 40)	59.6 (41.2–78.0)			
Severe (n = 21)	76.2 (53.1–99.4)			
Disability in social functioning		36.4	3	<.001
None (n = 27)	2.3 (0.0–5.6)			
Mild (n = 64)	17.6 (7.1–28.2)			
Moderate (n = 127)	43.2 (31.3–55.2)			
Severe (n = 99)	62.6 (51.7–73.5)			
Current medication side effects		6.9	1	<.05
Yes (n = 72)	56.3 (42.2–70.3)			
No (n = 240)	34.8 (27.0–42.6)			
Current illicit drug use problem		16.2	1	<.001
Yes (n = 99)	62.4 (50.5–74.2)			
No (n = 214)	32.3 (24.1–40.5)			
Current alcohol use problem		4.4	1	<.05
Yes (n = 123)	48.4 (38.0–58.9)			
No (n = 189)	34.2 (24.7–43.6)			
Current sleep problem		8.7	1	<.01
Yes (n = 138)	50.8 (40.8–60.7)			
No (n = 176)	30.9 (21.9–39.9)			

**TABLE 3**

Percentage of Patients with Treatment Compliance Problems by Treatment Characteristics

	% (95% CI)	$\chi^2$	df	<i>p</i>
Treatment setting		16.2	2	<.001
Inpatient (n = 104)	63.9 (53.5–74.3)			
Outpatient (n = 195)	31.5 (21.8–41.1)			
Partial/day treatment (n = 22)	40.4 (18.1–62.6)			
Medications Prescribed				
Antidepressant		2.7	1	0.1013
Yes (n = 192)	35.9 (26.5–45.3)			
No (n = 129)	47.5 (36.3–58.7)			
Antianxiety		0.5	1	0.4621
Yes (n = 109)	44.0 (31.7–56.4)			
No (n = 212)	38.6 (30.0–47.2)			
Antipsychotic		2.9	1	0.0898
Yes (n = 112)	49.0 (36.7–61.2)			
No (n = 209)	36.1 (26.8–45.4)			
Mood stabilizer		0.5	1	0.4780
Yes (n = 74)	44.8 (30.0–59.6)			
No (n = 247)	39.1 (31.0–47.2)			
Number medications prescribed		5.2	3	0.1601
No medications (n = 31)	39.7 (16.4–63.0)			
1 medication (n = 80)	42.0 (26.9–57.1)			
2 medications (n = 78)	27.5 (15.2–39.8)			
3 or more medications (n = 132)	47.2 (36.3–58.1)			
Psychotherapy (past 30 days)		0.2	1	0.6710
Yes (n = 140)	38.8 (27.8–49.8)			
No (n = 181)	41.9 (32.3–51.5)			
Crisis intervention (outpatients)		6.7	1	<.01
Yes (n = 29)	71.8 (52.1–91.4)			
No (n = 188)	37.2 (29.4–45.0)			

**TABLE 4**

Percentage of Patients with Treatment Compliance Problems by Health Plan Characteristics

	% (95% CI)	$\chi^2$	df	<i>p</i>
Patient has health insurance		2.4	1	0.2961
Yes (n = 207)	40.6 (31.3–49.8)			
No (n = 90)	45.9 (32.5–59.3)			
Type of health plan		1.3	1	0.7339
Managed (n = 82)	45.0 (31.4–58.6)			
Non-managed (n = 98)	38.0 (24.8–51.2)			
Main source of payment		8.4	2	<.05
Private insurance (n = 77)	42.3 (29.8–54.8)			
Public insurance (n = 173)	47.1 (37.2–56.9)			
Self pay (n = 60)	20.7 (7.7–33.8)			
Reimbursement mechanism		16.8	3	<.001
Salary (n = 176)	44.6 (35.4–53.8)			
Undiscounted FFS* (n = 39)	8.2 (0.4–16.0)			
Discounted FFS* (n = 85)	50.8 (34.3–67.3)			
Other (n = 18)	24.8 (0.0–50.9)			
Treatments subject to utilization review		3.4	1	<.05
No (n = 139)	33.5 (23.2–43.8)			
Yes (n = 182)	49.0 (39.7–58.3)			
Financial considerations affect choice of treatment		1.0	1	0.3314
No (n = 231)	38.1 (29.4–46.9)			
Yes (n = 90)	46.4 (32.2–60.7)			

\* FFS: Fee for Service.

**TABLE 5**

## Likelihood of Having a Treatment Compliance Problem

Variable	Adjusted OR* (95% CI)
Personality disorder	2.6 (1.3–5.5)
GAF score 50 or below	3.6 (1.8–7.4)
Current illicit drug use problem	4.0 (2.1–7.8)
Medication side effects	2.5 (1.4–4.6)
Psychiatrist reimbursement mechanism	
Salary	3.0 (1.0–9.2)
Undiscounted FFS	— <sup>†</sup>
Discounted FFS	5.4 (1.6–18.8)

\* The model adjusted for demographic (gender, race, marital status, age, education, and employment status); clinical (diagnosis, psychosocial problems, symptom severity, GAF score, current medication side effects, illicit drug or alcohol problem, and sleep problem); treatment (locus of care, type and number of medications, use of psychotherapy) and health plan factors (type of health plan, source of payment, and psychiatrist reimbursement mechanism).

<sup>†</sup> Reference level.