

Gender Differences in Substance Use Treatment Entry and Retention Among Prisoners With Substance Use Histories

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Drug abuse has been identified as the nation's most serious health problem, because it strains the health care system and has adverse effects on families, the economy, and public safety.¹ The considerable growth among prison populations during the past decade has largely involved individuals with substance abuse problems.² The national incarceration rate has steadily increased, and more than 550,000 individuals now return to their communities each year, most of them with untreated drug abuse problems.³ Thus, the public health role of the criminal justice system is now greater than ever before.⁴

Although research shows treatment to be effective, there is a potential for enhancing its effectiveness through a better understanding of treatment entry and retention.^{4,5} An understanding of treatment entry in particular is important, because only a small number of substance users enter treatment.^{5,6} Most of the attention within the field of substance abuse has been on treatment retention—only recently, in the last decade, has attention been paid to help-seeking behavior.^{6,7} Encouraging appropriate help-seeking behavior by substance users can help reduce misuse, particularly by women, of health services other than substance abuse treatment.^{6,8,9}

Our understanding of treatment entry and retention within prison settings is very limited because there are few prison-based studies of treatment retention^{10,11} and no studies of treatment entry. The limited studies of treatment entry among community samples of various types of drug abusers^{7,12–19} encountered little consistency among the characteristics they found to be predictive of treatment entry.⁵ However, higher levels of problem severity have been associated with treatment volunteerism (volunteering for treatment). In addition, studies that include dynamic predictor factors (factors that change over time) have found that individuals with higher motivation are more likely to enter treatment.¹⁹

Objectives. We examined gender similarities and differences in the predictors of substance use treatment entry and of the combination of treatment entry and completion.

Methods. The sample consisted of 2219 male and female program participants. Maximum likelihood probit estimation was used to identify background and attitudinal characteristics predictive of substance use treatment entry and retention.

Results. We observed gender similarities and differences in predictors of treatment entry and the combination of treatment entry and completion. Many of the factors that attract individuals to treatment are the same ones that keep individuals in treatment.

Conclusions. Attitudinal predictors—namely, motivation to change—showed the greatest consistency between genders and between predictors of treatment entry and predictors of treatment entry and completion. (*Am J Public Health.* 2004;94:1418-1424)

The findings in the literature on treatment retention^{10,11} are similar to those on treatment entry: sociodemographic factors have been inconsistent predictors of retention^{11,20–30} and have generally not been strong predictors.^{6,10} However, various measures of motivation have been consistently related to treatment retention.^{10,25,26,29,31–34}

There is a growing awareness in the treatment retention literature of gender differences that may differentially affect retention for women.^{35,36} Women are more likely than men to enter treatment¹⁷ and to engage in drug treatment.³⁷ Some studies show women to be less likely than men to remain in drug treatment,^{23,27,28} whereas other reports have found no relationship.^{38,39} Women's programs that offer specialized services or interventions^{35,36,40–42} have higher retention rates. Research, however, has not systematically addressed the question of gender differences in treatment entry and treatment retention.

The purpose of our study was to examine treatment entry as well as the combination of treatment entry and completion. Previous research seldom has examined prison populations, and there is little information on gender differences in treatment entry or completion. Therefore, we examined individuals incarcerated in federal prisons and separately

examined men and women. Finally, we assessed whether differences existed between characteristics of individuals who merely enter treatment and individuals who both enter and complete treatment.

Retention was conceptualized as program completion, because federal prison programs have a defined time frame. Unlike previous research, which examined predictors of retention among individuals already admitted to a program, we examined the combination of treatment entry and retention. It was necessary to account for self-selection into treatment (i.e., volunteering), because the causal process of volunteering for treatment might be similar to that of volunteering for and completing treatment.

METHODS

Participants

Participants took part in an evaluation of the Federal Bureau of Prisons' (BOP's) residential drug abuse treatment programs. Participants were in 4 female "unit-based" (all participants reside in the same housing unit) programs or 16 male unit-based programs and were admitted to treatment between 1991 and 1995. Three of the programs were 1000-hour interventions that offered treatment over

a 12-month period. The remaining 17 programs were 9-month, 500-hour interventions. The cognitive-behavioral treatment programs emphasized relapse prevention and criminal lifestyle issues. Admission criteria required that inmates be within 36 months of release and have a moderate to severe substance use problem. Treatment volunteers did not choose between the 12-month and 9-month programs, because their choices were limited to the programs available at their prison.

Comparison subjects were randomly selected from among individuals who met the criteria for admission to the programs but who did not volunteer for treatment. Individuals who met criteria for program admission but who did not volunteer for treatment were randomly selected from 40 prisons between 1993 and 1995. To ensure that these comparison subjects did not later become treatment participants, selection was made only from among inmates who had less than 15 months remaining on their sentences. The overall sample consisted of 2219 participants. Of 1734 men, 1189 were treatment participants and 545 were comparison participants; of 485 women, 300 were treatment participants and 185 were comparison participants.

Measures

Experimental predictors were background and attitudinal characteristics found to be predictive of treatment entry or treatment retention in other studies, background characteristics which differed between men and women who use drugs, and attitudinal measures with theoretical relevance to drug treatment programs.⁴³ Data were derived from the BOP's automated database and from inmate interviews and surveys. To forestall refusals, it was arranged that inmates would continue to receive their normal pay (for assigned work) while participating in the research.

Demographic characteristics were race/ethnicity, years of education, and ever having been legally married. Indicators of criminal history included severity of current offense, history of violence, age at time of most recent commitment, age at first arrest, and sentence length. In addition to employment status in the month before incarceration, a variety of family background items were included: fam-

ily ties, spouse substance use problems, plans to live with minor children (aged ≤ 18 years) after release, history of physical abuse before 18 years of age, and history of sexual abuse. Substance use history was categorized by type of drug or drugs ever used on a daily basis. Other items included history of drug treatment and previous illegal drug use quit attempts of at least 30 days' duration. Lifetime *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition*⁴⁴ diagnostic information for depression and antisocial personality disorder was obtained with the automated Diagnostic Interview Schedule, which has been found to be reliable and valid.^{45,46}

The 4 stages of Prochaska's Change Assessment Scale were used to measure internal motivation.⁴⁷ Individuals must realize that they have a problem, i.e., not deny their problem (precontemplation); contemplate acting to address the problem (contemplation); take specific action (action); and after taking action, use strategies to maintain change (maintenance). Another attitudinal measure used was the Hope Scale,⁴⁸ which comprises 2 subscales. The first subscale, *agency*, refers to a person's sense of successful determination in relationship to reaching his or her general goals. The second subscale, *pathway*, refers to a person's sense of being able to plan to meet his or her goals. The final attitudinal measure was the deliberate problem-solving subscale of the ways of coping questionnaire.⁴⁹

A measure of external incentive provided an indication of whether an individual was eligible for a sentence reduction (in increments up to 1 year) for successful program completion. This incentive became available at the midpoint of the data collection period; thus, it was possible to identify whether the individual volunteered before or after this incentive became available and how much time he or she could have gained: no time, less than 5.5 months off, or more than 5.5 months off.

Treatment completion was defined as completing either the 9- or the 12-month program. Reasons for treatment noncompletion included discharge for disciplinary reasons, termination for administrative reasons (e.g., released before completion), and dropout. The analyses distinguished the 9- and 12-

month programs because of the possibility that completing a 12-month, 1000-hour program is more difficult than completing a 9-month, 500-hour program.

Design

Maximum likelihood probit estimation procedures were used to provide estimated probabilities for the two outcomes. The choice of a probit procedure rather than a logit procedure was one of convenience, because the results derived from these 2 procedures are very similar.^{50,51} Methodological details are available elsewhere.⁴⁴

RESULTS

Effects vector coding, wherein each coefficient represents the contrast of a specific category with the adjusted grand mean, was used for categorical variables. However, for preincarceration drug use, dummy variable coding was used to compare each category with the referent category of no daily substance use in the year before incarceration.

A positive probit coefficient implied a greater likelihood of entering or completing treatment, whereas a negative coefficient implied a reduced likelihood. The Wald χ^2 test⁵² was used to test for gender differences between coefficients when coefficients were significant. For simplicity, the results displayed in Tables 1 and 2 include only variables that were significant. Results for the type of program (12 month or 9 month) were excluded from those reported for treatment entry, because the coefficient representing the type of program (12 month or 9 month), because individuals were not able to choose between the 2 types of programs. Table 3 displays characteristics found to be significant in 1 or more models. Although women had more problems in employment and depression and were more likely to have a history of physical abuse, they also had higher levels of internal motivation.

Treatment Entry

Table 1 displays the results for treatment entry. Race/ethnicity was unrelated to treatment entry. However, both men and women of higher education levels were less likely to enter treatment. An effect was found for having been convicted of an offense of moderate

TABLE 1—Predictors of Treatment Entry for Men and Women: Maximum Likelihood Probit Estimation

Characteristic	Men	Women
	Estimate (SE)	Estimate (SE)
Race/ethnicity		
African American	0.019 (0.119)	0.476 (0.215)*
Other	-0.071 (0.208)	-0.373 (0.380)
Severity of offense		
Moderate	0.203 (0.081)**	-0.375 (0.142)*
High	-0.167 (0.111)	0.054 (0.193)
Greatest	0.010 (0.108)	0.324 (0.242)
Average/good family ties	-0.273 (0.089)**	0.269 (0.121)*
Education level	-0.073 (0.024)**	-0.096 (0.043)*
Employment at time of incarceration		
Employed	0.056 (0.113)	0.346 (0.186)
Not in workforce	-0.132 (0.201)	0.622 (0.312)*
Unemployed	-0.029 (0.155)	-0.239 (0.249)
Unknown status	0.221 (0.305)	-0.838 (0.440)
Substance use history before arrest		
Daily use of alcohol only	-0.058 (0.138)	1.157 (0.508)*
Daily use of marijuana only	-0.089 (0.111)	-0.512 (0.254)*
Daily use of marijuana and other illicit drug(s)	0.100 (0.101)	-0.039 (0.237)
Psychiatric diagnoses		
Depression only	0.005 (0.168)	-0.475 (0.209)*
Antisocial personality disorder only	-0.074 (0.105)	0.270 (0.233)
Both antisocial personality disorder and depression	-0.247 (0.156)	-0.492 (0.227)*
Neither antisocial personality disorder nor depression	0.039 (0.096)	0.332 (0.164)*
Family characteristics		
History of physical abuse (before 18 years of age)	-0.029 (0.074)	0.217 (0.107)*
Plan to live with minor children after release	0.148 (0.057)**	0.246 (0.102)*
Internal motivation score (Prochaska's Change Assessment Scale)		
Precontemplation	-0.495 (0.091)**	-0.622 (0.181)**
Contemplation	0.642 (0.178)**	0.556 (0.324)
Action	-0.032 (0.170)	-0.445 (0.290)
Maintenance	0.310 (0.106)**	0.497 (0.211)*
External incentive of sentence reduction		
Year off—0 months	-0.593 (0.205)**	-0.309 (0.247)
Year off—1 to 5 months	-0.492 (0.149)**	-0.319 (0.177)
Year off—5 to 12 months	-0.026 (0.165)	-0.238 (0.208)
Type of program		
12-month	0.113 (0.072)	-0.427 (0.152)**
Constant	-0.641 (0.619)	0.590 (1.081)

* $P < .05$; ** $P < .01$.

severity, but the direction of the effect for men was opposite that for women: whereas women with a moderate-severity offense were less likely to enter treatment, men with a moderate-severity offense were more likely to enter treatment. Results of Wald χ^2 tests for

the difference between coefficients were significant ($\chi^2 = 12.5$; $P < .05$).

Opposite effects for family ties were found between men and women. Women with “average/good” family ties were more likely to enter treatment, whereas men with “average/good”

family ties were less likely to do so. Women who were not in the labor force before incarceration were more likely to enter treatment. In contrast, employment history was unrelated to treatment entry for men. Results of Wald χ^2 tests showed both of these coefficients to differ between men and women: $\chi^2 = 13.05$ for family ties and $\chi^2 = 4.14$ for not being in the labor force.

Among men, there were no significant effects for type of substance use. In contrast, among women, 2 categories of prearrest daily substance use were related to treatment entry. Women who used marijuana only were *less* likely to enter treatment, and women who used alcohol only were *more* likely to enter treatment. Results of Wald χ^2 tests showed that only the coefficient for alcohol use ($\chi^2 = 5.68$) was a significant gender difference.

Antisocial personality disorder and depression diagnoses were related to treatment entry for women but not for men. Women with neither diagnosis were more likely to enter treatment, whereas women with a diagnosis of depression, either alone or in combination with antisocial personality disorder, were less likely to enter treatment. The coefficients for these diagnoses did not differ significantly from those for men.

Both men and women planning to live with minor children after release were more likely to enter treatment. Women who had been physically abused before 18 years of age were more likely to enter treatment. This characteristic was not significant for men, and results of the test of differences between coefficients for men and women were not significant.

Results for the Change Assessment Scale were similar for men and women. Men and women with high precontemplation scores (is unaware of drug problem) were less likely to enter treatment, whereas individuals with high maintenance scores (works to maintain the gains previously made and prevent relapse) were more likely to enter treatment. Among men, those with high contemplation scores (recognizes problem and is contemplating taking action) were more likely to enter treatment. Among women, the coefficient for contemplation was marginally significant (at the conventional .05 level) and in the same direction as among men, but the coefficients did not significantly differ.

TABLE 2—Predictors of Treatment Entry and Completion for Men and Women: Maximum Likelihood Probit Estimation

Characteristic	Men	Women
	Estimate (SE)	Estimate (SE)
Severity of offense		
Moderate	0.108 (0.065)	-0.264 (0.121)*
High	-0.097 (0.091)	0.122 (0.172)
Greatest	0.219 (0.091)*	0.503 (0.211)*
Age		
At first arrest	-0.002 (0.006)	0.031 (0.013)*
At time of commitment	0.013 (0.006)*	-0.003 (0.014)
Average/good family ties	-0.197 (0.073)**	0.192 (0.104)
History of violence		
<5 years ago	-0.230 (0.079)**	-0.248 (0.221)
>5 years ago	0.068 (0.070)	0.133 (0.223)
Sentence length (months)	-0.001 (0.000)*	-0.004 (0.003)
Substance use and drug treatment history before arrest		
Daily use of alcohol only	0.000 (0.108)	-0.480 (0.306)
Daily use of marijuana only	0.014 (0.089)	0.261 (0.212)
Daily use of marijuana and other illicit drug(s)	0.087 (0.079)	0.286 (0.172)
Previous drug treatment	-0.094 (0.046)*	0.079 (0.087)
Psychiatric diagnosis		
Depression only	0.138 (0.133)	-0.254 (0.190)
Antisocial personality disorder only	0.057 (0.084)	0.506 (0.180)**
Both antisocial personality disorder and depression	-0.121 (0.134)	-0.397 (0.202)*
Neither antisocial personality disorder nor depression	0.151 (0.076)*	0.373 (0.138)**
Plan to live with minor children after release	0.149 (0.045)**	0.148 (0.084)
Internal motivation score (Prochaska's Change Assessment Scale)		
Precontemplation	-0.396 (0.075)**	-0.429 (0.168)**
Contemplation	0.447 (0.149)**	0.333 (0.320)
Action	-0.172 (0.145)	-0.450 (0.295)
Maintenance	0.264 (0.089)**	0.639 (0.210)**
External incentive of sentence reduction		
Year off—0 months	-0.560 (0.217)**	-0.207 (0.292)
Year off—1 to 5 months	-0.281 (0.144)	-0.090 (0.186)
Year off—5 to 12 months	0.036 (0.157)	-0.225 (0.208)
Type of program		
12-month	-0.121 (0.052)*	-0.285 (0.118)*
Constant	-3.909 (0.459)**	-3.647 (0.931)**

* $P < .05$; ** $P < .01$.

Results of the measure of external incentive—the year-off incentive—differed between men and women. Among men, those ineligible for a sentence reduction and those eligible only for a reduction of 5.5 or fewer months were less likely to enter treatment compared with those eligible for greater reductions. Although the coefficients were not significant for women, χ^2 tests did not show the coefficients

for men to be significantly different from those for women.

Treatment Entry and Completion

Approximately 78% of the men and 64% of the women completed treatment. The program completion rate was lower for the 12-month than for the 9-month program participants. Among men, 74% of the 12-month

participants completed treatment, compared with 80% of the 9-month participants. Among women, the percentages were 60% and 67%, respectively.

The results displayed in Table 2 show that race/ethnicity was not related to entering and completing treatment. Among both men and women, those with a greater-severity offense were more likely to complete treatment. In contrast, among women only, those with a moderate-severity offense were less likely to complete treatment. The nonsignificant coefficient for men was found to differ significantly from that for women ($\chi^2 = 7.44$) and was in the opposite direction.

Chi-square tests showed that the apparent gender differences for other indicators of criminal history were sustained only for age at first arrest. Women who were older at their first arrest were more likely to complete treatment. The coefficient for men, although not significant, was in the opposite direction ($\chi^2 = 9.40$). Men with a recent (i.e., within the past 5 years) history of violence and those with longer sentence lengths were less likely to complete treatment, whereas men who were older at the time of their current commitment were more likely to complete treatment.

Family ties were related to treatment completion among men but not among women. Men with average/good family ties were less likely to complete treatment. The coefficient for women differed from that for men ($\chi^2 = 9.39$) and, although not significant, was in the opposite direction.

There were no significant effects among either men or women for type of substance use. However, among men only, those with a history of drug treatment were less likely to complete treatment. The coefficient for women was nonsignificant but was significantly different from that for men ($\chi^2 = 19.59$).

Men and women without either a diagnosis of antisocial personality disorder or a diagnosis of depression were more likely to complete treatment. Among women only, those with a diagnosis of antisocial personality disorder only were more likely to complete treatment, whereas those with both diagnoses were less likely to complete treatment. Chi-square tests showed that only the coefficient for a diagnosis of antisocial per-

TABLE 3—Characteristics of Men and Women Eligible to Enter Residential Drug Treatment

	Men	Women
White, %	62.6%	50.9%
Highest grade completed (mean no. of years), y	12.1	11.5
Age, y		
At time of commitment (mean)	34.0	32.8
At first arrest (mean)	21.3	24.2
Severity of offense, %		
Moderate	42.2	46.6
Greatest	20.6	9.3
Average/good family ties, %	92.8	84.3
Employment at time of incarceration, % ^a		
Employed	53.3	37.3
Not in workforce	3.9	7.5
Sentence length (mean), mo	82.3	40.0
Recent history of violence (< 5 years ago), %	14.4	7.2
Substance abuse history (1 year before arrest), %		
No daily drug/alcohol use	16.5	13.6
Daily use of alcohol only	10.9	3.7
Daily use of illicit drug—marijuana only	17.9	14.0
Daily use of illicit drug other than marijuana—cocaine, heroin, opiates, barbiturates, etc.	54.7	68.7
Psychiatric diagnosis, %		
Depression only	7.9	19.4
Antisocial personality (ASP) only	28.4	16.9
Both depression and ASP	8.1	13.3
Neither depression nor ASP	55.6	50.4
Plan to live with minor children after release, %	38.2	60.0
History of physical abuse (before 18 years of age), %	15.5	31.3
Internal motivation score (Prochaska's Change Assessment Scale)		
Precontemplation (mean)	1.95	1.59
Contemplation (mean)	3.37	3.15
Action (mean)	3.38	3.14
Maintenance (mean)	2.78	2.62
Year-off provision but no time available, %	18.8	7.7
Type of program: 12 month (treatment participants only), %	23.8	36.7

^aPercentages do not sum to 100 because not all categories of employment are included in the table.

sonality disorder differed between men and women ($\chi^2=5.12$).

Men who planned to live with minor children after release were more likely to complete treatment. Although no such effect was apparent for women, χ^2 tests showed that the coefficients did not differ.

Among both men and women, those with high precontemplation scores were less likely to complete treatment, whereas those with high maintenance scores were more likely to complete treatment. Among men only, those with higher contemplation scores

were more likely to complete treatment. This coefficient for women was nonsignificant and did not significantly differ from that for men.

Among men only, external incentives were related to treatment completion: men who could not have benefited from the sentence reduction provision were less likely to complete treatment. The coefficient for men was not significantly different from that for women. Among both men and women, individuals who entered a 12-month program were less likely to complete treatment.

DISCUSSION

The results of this study indicate that greater attention should be paid to treatment entry, particularly in prison settings, where substance abuse treatment is often voluntary and where individuals who enter treatment are very likely to complete treatment. Because retention is higher than in non-prison based treatment programs and because an increasing number of drug users are incarcerated, a question of greater importance is whether the intended or ideal target population is being reached. Criminal justice settings currently provide an opportunity to ameliorate public health problems, such as AIDS associated with drug use, because a large percentage of substance users are involved in the criminal justice system.

Although federal prison drug treatment programs do not target any specific subpopulation of substance abusers, our findings suggest policy modifications that could better address the issues of all those needing treatment. The importance of internal motivation for treatment entry and retention among both genders implies a broader application is needed of interventions that have been found to increase internal motivation. Motivational enhancement intervention research has shown that such interventions can enhance a client's motivation to change^{53–55} and that motivational interviewing can increase session attendance and the likelihood of treatment completion.^{55,56} The use of such interventions could help kindle motivation among individuals entering treatment. Individuals with initial low levels of motivation could be referred to a pretreatment program to enhance their motivation for treatment. Alternatively, because treatment resources are often limited, efficiency might be enhanced by requiring that individuals reach a minimal threshold of motivation before admission.

Both internal and external motivations draw individuals into treatment. Previous research on external motivation has been carried out primarily within the context of community-based programs, where external motivation is often defined as coerced treatment (e.g., legal pressure).^{57,58} However, little is known about the effect of external incentives, such as sentence reductions, that can be

offered in prison settings. Our findings indicate that in addition to such “carrots” as sentence reduction, internal motivation is very important because it remained a predictor of treatment entry and treatment completion in the presence of external incentives.

Our finding that women without diagnoses of depression or antisocial personality disorder were more likely to enter treatment comes at a time of increasing recognition of the needs of substance abusers with co-occurring disorders.^{59,60} Treatment effectiveness may be enhanced by ensuring that individuals with comorbid psychiatric problems and drug use enter and complete treatment. This study found a greater percentage of women than men with diagnoses of depression. This is consistent with previous research findings where women, more often than men, were found to use drugs to alleviate physical or emotional pain or to cope with depression.^{61–64} Previous findings have also shown that women are more likely than men to view their problems in terms of health concerns and psychological distress^{8,9} and to be motivated to enter treatment because of psychological and social pressures.⁶⁵ Thus, if drug treatment is perceived by potential treatment volunteers as focusing on substance use rather than on the psychological distress that might motivate them to seek treatment, they may be less likely to enter treatment.⁴ For women, motivational programs and treatment programs will need to clearly emphasize the role of substance abuse treatment in alleviating depression and other psychological distress. Simultaneously addressing women’s psychological problems and substance use while they are incarcerated could prevent the misuse of other health and mental services after release.

Placing predictors of treatment entry for women within the context of background characteristics highlights the relevance of social pressures and relationships. Women were more likely to have a history of physical abuse, to have a diagnosis of depression, and to report that they planned to live with minor children after release but were less likely to have positive family ties. All of these factors are related to treatment entry for women. Addressing personal problems that caused them to self-medicate with illegal drugs in the first

place may enhance women’s motivation for treatment. Most women reported they will be responsible for minor children when released from prison. Thus, treatment entry and retention may be enhanced by women’s recognition that substance use treatment may have a positive effect on their family relationships.

Both men and women were less likely to complete the 12-month program compared with the 9-month program, which indicates the importance of determining an optimal treatment length and intensity level in terms of both adherence and outcome.

Our study improves the understanding of treatment retention by comparing factors that predict treatment entry with factors that predict both treatment entry and retention. Because levels of drug use among state prisoners and local jail inmates are even higher than among those in the federal systems, our findings should also be relevant for drug treatment programs in those correctional settings. Many of the same processes that attract individuals to treatment also keep individuals in treatment. Motivation to change leads individuals to enter treatment and also leads them to remain in treatment. Social ties and external incentives are associated with treatment entry but also with treatment retention. If the same factors that lead an individual to seek help also keep the individual in treatment, the focus of research should be on treatment entry to ensure that the individuals who are most in need of treatment and who can most benefit from it are the ones who receive treatment. However, because treatment availability and treatment admission processes may differ in nonfederal correctional settings, future studies need to identify additional crucial issues surrounding treatment entry. ■

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