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Gender differences among in- and out-of-treatment opioid-addicted individuals

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Abstract

Objective—Gender differences were explored among 355 in- and out-of-treatment opioid-addicted adults in Baltimore.

Methods—Addiction Severity Index and other variables were compared among: 1) in-treatment women *v*. out-of-treatment women; 2) out-of-treatment: women *v*. men; and, 3) in-treatment: women *v*. men.

Results—Analysis indicated that in-treatment and out-of-treatment women worked less and used more cocaine than their male counterparts (*ps*<.01). Moreover, out-of-treatment women used heroin and cocaine more often, spent more money on drugs, earned more illegal income, and had fewer treatments than in-treatment women (*ps*≤.01).

Conclusions—Findings indicate greater severity of drug and employment problems of opioid-addicted women and underline the need for gender-specific drug-treatment services.

Keywords

Opioid addiction; methadone treatment; women; gender

Introduction

Women comprise a growing percentage of admissions to drug-treatment programs, yet are still underrepresented in drug-abuse treatment compared to men (1). Further, their rates of HIV infection and incarceration have increased over the past two decades (2,3). According to the Center for Disease Control (2), adolescent girls and adult women accounted for 26% of all newly-diagnosed HIV cases in the United States in 2005. In addition, the rate of incarceration for women has increased faster than that of men, climbing at an average annual rate of 4.6% from 1995 to 2005 (3).

Although the number of women entering drug treatment has increased in recent years (1), it remains considerably lower than the estimated number of women needing such treatment (4). Thus, the large numbers of out-of-treatment opioid-dependent women are unable to benefit from the proven ability of drug-abuse treatment--particularly methadone maintenance treatment--to reduce drug use, HIV-risk behaviors, and crime (5,6,7). Given the paucity of

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knowledge about out-of-treatment opioid-dependent women, there is a need to study the role that gender differences play in drug-abuse treatment entry (8).

A number of studies have examined gender differences among adults entering drug-abuse treatment. Women use more cocaine, have higher levels of psychiatric distress and more suicide attempts, have more physical health problems, and are less frequently employed than men entering treatment (9,10,11,12,13). Additionally, women entering drug-abuse treatment are less likely to be involved in the criminal justice system than men (9,12), although findings from the multi-site Drug Abuse Treatment Outcome Study (DATOS) indicated that women reported more illegal activity in the year prior to treatment enrollment (13).

Few studies exist comparing opioid-dependent women entering methadone treatment with women who are not in treatment. A cross-sectional, multi-site study conducted between 1989 and 1991 compared the characteristics of injection drug-using women entering methadone treatment to women not entering treatment recruited through a street outreach program in four cities (14). Women entering treatment were found to be similar to women not entering treatment in age, education, employment, and age at first injection, but to have been engaged in significantly more illegal activity and drug injection and less cocaine use in the six months prior to interview. Additionally, women enrolling in treatment had a history of more drug treatment episodes.

Given the importance of understanding out-of-treatment heroin-addicted women in order to identify issues and strategies for engaging them in drug-abuse treatment, this study was undertaken as part of a parent study examining entry and engagement in methadone treatment (15) to: 1) examine gender differences among opioid-dependent adults who are out of treatment; and 2) compare gender differences among such adults in an out-of-treatment cohort with a cohort enrolling in methadone treatment.

Methods

Participants

The sample consisted of 355 participants, including 244 individuals (104 women, 140 men) enrolling in methadone treatment in Baltimore and 111 individuals (50 women, 61 men) not seeking drug-abuse treatment. Study eligibility required that participants were at least 18 years old and met the criteria for methadone maintenance treatment. Further, participants in the out-of-treatment group were only eligible if they had neither been in nor sought drug treatment during the 12-month period preceding recruitment.

In-treatment participants were recruited from one of six Baltimore area methadone treatment programs and completed a baseline interview within one week following program admission. Out-of-treatment participants were recruited from one of twelve street locations in Baltimore City chosen through targeted-sampling methods described elsewhere (16). All participants provided informed consent in keeping with the Friends Research Institute's Institutional Review Board approval of this study.

Measures

Participants were administered the Addiction Severity Index (ASI) (17) and the Friends Research Supplemental Questionnaire (18) at baseline. The ASI is a valid and reliable instrument that measures current and lifetime functioning in seven different domains: alcohol use; drug use; medical; psychiatric; family/social; employment; and legal (19,20). Selected ASI items, focused on the past 30 days activities, are combined within each domain to create seven composite scores ranging from 0 (no problem) to 1 (extreme problem).

Friends Research Supplemental Questionnaire asks participants to answer detailed questions regarding early criminal behavior, arrests, drug use, and previous treatment experiences. It was developed to provide a more in-depth history of drug use and criminal behavior than afforded by the ASI and has been used extensively in research conducted by our center's investigators (18).

Statistical Analysis

Three sets of parallel analyses were conducted comparing two groups at a time on sample demographics, current and lifetime drug use, and criminal history using χ^2 goodness-of-fit tests for categorical variables and one-way analysis of variance for continuous variables. Regression analysis was utilized to investigate pairwise group differences on ASI composite scores. These latter analyses held constant age, ethnicity, marital status, years of education, number of lifetime drug-treatment episodes, age at onset of heroin use, and number of days used cocaine during the past 30 days.

Results

Sample characteristics

The sample consisted of 355 participants, including 154 (43%) women and 201 (57%) men. Sixty-nine percent of the sample were entering treatment, including 104 (43%) women and 140 (57%) men. The 111 participants who were not entering treatment consisted of 50 (45%) women and 61 (55%) men.

Seventy-four percent of the total sample was African American/other, and 24% were married. Mean age for the total sample was 41 years (*SD*=8.1), mean years of education completed was 11 years (*SD*=1.7), and participants worked an average of 5 days (*SD*=8.8) in the 30 days prior to baseline.

In-treatment women v. out-of-treatment women

With respect to all women in the sample, in-treatment women were more likely to be African American/other ($p<.05$) and more educated ($p<.05$) than out-of-treatment women (see Table 1). The two groups did not differ on age, marital status, or number of days worked in the 30 days prior to baseline.

Regarding drug-abuse history, in-treatment women and out-of-treatment women did not differ significantly in age of onset of heroin or cocaine use, age at first crime, or days of alcohol intoxication in the past 30 days. However, out-of-treatment women had a more severe profile of drug use and criminal activity than in-treatment women. In the 30 days prior to baseline, the out-of-treatment women used cocaine on twice as many days ($p<.001$), used heroin on more days ($p=.01$), spent almost twice as much money on drugs ($p<.001$), and earned nearly five times the illegal income ($p<.001$) as in-treatment women. Out-of-treatment women additionally had fewer lifetime drug-treatment episodes ($p<.001$).

Table 1 also shows the differences between the respective pairs of groups for ASI composite scores while holding constant age, ethnicity, marital status, years of education, number of lifetime drug-treatment episodes, age of onset of heroin use, and number of days used cocaine during the past 30 days. In comparison to in-treatment women, out-of-treatment women had significantly higher scores on the Employment ($p<.05$) and Legal ($p<.01$) composites.

Out-of-treatment gender differences

Out-of-treatment women and men did not differ significantly with regard to ethnicity, marital status, or years of education (see Table 2). However, out-of-treatment women were

significantly younger ($p<.05$), and worked significantly fewer days ($p<.001$) than out-of-treatment men.

Table 2 additionally shows that out-of-treatment women and men did not significantly differ in age of onset of cocaine use, number of prior drug-treatment episodes, days of heroin use or alcohol intoxication in the past 30 days, or money spent on drugs in the past 30 days. The out-of-treatment women began using heroin ($p<.05$) and committing crime ($p<.05$) later than their male counterparts and had more days of cocaine use in the past 30 days ($p<.01$). Out-of-treatment women and men did not significantly differ in terms of illegal income earned in the 30 days prior to baseline interview.

With regards to ASI composite scores, out-of-treatment women had significantly higher Employment composite scores than out-of-treatment men ($p<.01$), but showed no significant differences on Medical, Alcohol use, Drug use, Legal, Family/Social, and Psychiatric composites.

In-treatment gender differences

There were no statistically significant differences between the women and men who were entering treatment on ethnicity, marital status, age, and years of education. However, the in-treatment women had worked significantly fewer days than the in-treatment men (2.3 days [*SD*=6.4] *v.* 6.5 days [*SD*=9.7]; $p<.001$).

With regards to drug-abuse history, there were no significant differences between in-treatment women and men in age of onset of cocaine use and number of prior drug-treatment episodes. However, in-treatment women did begin to use heroin (23.2 years [*SD*=6.2] *v.* 21.0 years [*SD*=6.8]; $p<.01$) and commit crime (19.0 years [*SD*=8.6] *v.* 15.4 years [*SD*=5.8]; $p<.001$) significantly later in life than in-treatment men. Regarding recent drug use and criminal behavior, the women did not differ significantly than the men on mean days of heroin use, alcohol intoxication, or money spent on drugs in the past 30 days, but did use cocaine on significantly more days (12.0 days [*SD*=12.3] *v.* 7.6 days [*SD*=10.3]; $p<.01$) and earn significantly less illegal income ($227 [*SD*=479] *v.* $604 [*SD*=1026]; $p=.001$) than the men in the 30 days prior to the baseline interview.

Analyses of ASI composite scores indicated that in-treatment women had significantly higher scores on Medical (.15 [*SE*=.03] *v.* .09 [*SE*=.02]; $p<.05$), Employment (.85 [*SE*=.03] *v.* .72 [*SE*=.02]; $p<.001$), Family/Social (.11 [*SE*=.02] *v.* .06 [*SE*=.01]; $p<.01$), and Psychiatric (.13 [*SE*=.02] *v.* .04 [*SE*=.02]; $p<.001$), but significantly lower scores on the Legal composite (.19 [*SE*=.02] *v.* .27 [*SE*=.02]; $p<.01$) than in-treatment men.

Discussion

The purpose of this study was to identify gender differences among opioid-dependent individuals enrolling in methadone treatment and those individuals not seeking treatment. Our results indicated that in the month prior to study enrollment, out-of-treatment women used cocaine on twice as many days, earned five times as much illegal income, and spent nearly twice as much money on drugs as in-treatment women. In addition, the out-of-treatment women had more serious Employment and Legal composite scores and had fewer prior treatment episodes than the in-treatment women. These findings are consistent with those of Wechsberg and Cavanaugh (14) regarding cocaine use and lifetime history of drug-abuse treatment, but are in contrast to their findings regarding illegal activity.

These results suggest that opioid-dependent out-of-treatment women differ considerably from women entering treatment and, therefore, may require unique outreach strategies (14). Indeed,

the more severe patterns of drug use and illegal activities of out-of-treatment women make crafting approaches to attract them to treatment of significant public health importance.

Out-of-treatment women, as compared with out-of-treatment men, also reported using cocaine on significantly more days and showed greater severity on ASI Employment composites, but reported no significant differences in terms of money spent on drugs and illegal income earned. Several studies suggest that a barrier to treatment for drug-using women is their relative lack of financial independence (13). Findings from the present study indicate the need for approaches, such as sheltered employment using contingency management (21), to engage out-of-treatment opioid-dependent women and to address their cocaine use and employment problems.

In-treatment women had a more severe drug use profile in terms of recent cocaine use compared with in-treatment men, although the women's illegal income was significantly less. In addition, the women entering treatment had higher Employment, Medical, Psychiatric, and Family/Social composites, although their Legal composites were lower than the men's composites. These findings are generally consistent with results reported from the DATOS study (13). Future studies that examine gender differences in drug-abuse treatment are needed to guide efforts to improve treatment entry.

There are several limitations to the study. First, the results were based on self-reports from the ASI. While self-reports when obtained under confidential research conditions such as in the present study have been shown to be relatively accurate, they may be subject to some inaccuracy (22). Second, the findings were obtained from one city with a large African-American population and an endemic heroin problem and may not generalize to other populations.

Given the increasing public health problems, including HIV infection and incarceration, among heroin-dependent women, it is important to learn more about this population, as well as the factors that deter them from treatment and the factors that lead them to enter treatment. More research is needed to develop gender-specific outreach strategies and to address the severe cocaine and employment problems of out-of-treatment women.

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Table 1

In-treatment women *vs.* out-of treatment-women: Demographics, drug use and criminal history, and model-derived estimated means for ASI composite scores (*N* = 154)

Variable	In-treatment women (*n* = 104)	Out-of-treatment women (*n* = 50)
Demographic		
African American/other, *n* (%)	**82 (78.8%)**	**32 (64.0%)**
Married, *n* (%)	27 (26.0%)	12 (24.0%)
Age, mean (*SD*)	39.5 (7.9)	40.1 (7.7)
Years of education, mean (*SD*)	**11.4 (1.6)**	**10.7 (1.8)**
Number of days worked past 30 days, mean (*SD*)	2.3 (6.4)	.5 (2.9)
Lifetime (mean, *SD*)		
Age of onset of heroin use	23.2 (6.2)	23.3 (7.6)
Age of onset of cocaine use	24.8 (7.6)	24.0 (8.0)
Age at first crime	19.0 (8.6)	19.1 (9.8)
No. of drug treatment episodes	**3.2 (2.5)**	**1.2 (0.9)**
Past 30 Days (mean, *SD*)		
Days of heroin use	**26.9 (8.5)**	**30.0 (0.0)**
Days of cocaine use	**12.0 (12.3)**	**25.2 (9.1)**
Days of alcohol intoxication	4.4 (8.9)	5.0 (9.9)
Money spent on drugs	**731.1 (608.2)**	**1207.2 (966.3)**
Illegal income earned	**227.1 (478.8)**	**1058.7 (1176.4)**
ASI Composite (mean, *SE*)		
Employment	**.85 (.03)**	**.94 (.03)**
Legal	**.19 (.02)**	**.29 (.03)**
Medical	.15 (.03)	.13 (.04)
Alcohol	.08 (.02)	.14 (.03)
Drug use	.34 (.01)	.32 (.01)
Family/Social	.11 (.02)	.07 (.02)
Psychiatric	.13 (.02)	.09 (.02)

Note: Significant differences are denoted in boldface type. *N* is as follows for the following variables: age of onset of heroin use (*N* = 153), age of onset of cocaine use (*N* = 150), and age at first crime (*N* = 151). Differences are due to 1 in-treatment female who reported never having used heroin, 4 in-treatment females who reported never having used cocaine, and 3 in-treatment females who reported never having committed a crime (other than possession/use of illicit substances). The concomitant variables (covariates) in analyses with ASI composites were: age, ethnicity (Caucasian *v*. African American/other), marital status (married *v*. not married), years of education, number of lifetime drug-treatment episodes, age of onset of heroin use, and number of days used cocaine during past 30 days.

Table 2

Out-of-treatment women *vs*. out-of treatment men: Demographics, drug use and criminal history, and model-derived estimated means for ASI composite scores (N = 111)

Variable	Out-of-treatment women (n = 50)	Out-of-treatment men (n = 61)
Demographic		
African American/other, *n* (%)	32 (64.0%)	47 (77.0%)
Married, *n* (%)	12 (24.0%)	14 (23.0%)
Age, mean (*SD*)	**40.1 (7.7)**	**42.9 (7.1)**
Years of education, mean (*SD*)	10.7 (1.8)	11.4 (1.8)
Number of days worked past 30 days, mean (*SD*)	**.5 (2.9)**	**6.8 (11.3)**
Lifetime (mean, *SD*)		
Age of onset of heroin use	**23.3 (7.6)**	**20.1 (6.3)**
Age of onset of cocaine use	24.0 (8.0)	22.6 (7.6)
Age at first crime	**19.1 (9.8)**	**15.5 (6.0)**
No. of drug treatment episodes	1.2 (0.9)	0.9 (1.1)
Past 30 Days (mean, *SD*)		
Days of heroin use	30.0 (0.0)	29.7 (1.2)
Days of cocaine use	**25.2 (9.1)**	**18.4 (12.3)**
Days of alcohol intoxication	5.0 (9.9)	7.1 (10.3)
Money spent on drugs	1207.2 (966.3)	1214.4 (1127.3)
Illegal income earned	1058.7 (1176.4)	1005.3 (1368.4)
ASI Composite (mean, *SE*)		
Employment	**.94 (.03)**	**.82 (.03)**
Legal	.29 (.03)	.29 (.03)
Medical	.13 (.04)	.10 (.04)
Alcohol	.14 (.03)	.12 (.02)
Drug use	.32 (.01)	.31 (.01)
Family/Social	.07 (.02)	.07 (.02)
Psychiatric	.09 (.02)	.05 (.02)

Note: Significant differences are denoted in boldface type. N = 108 for age of onset of cocaine use due to 3 out-of-treatment males who reported never having used cocaine. The concomitant variables (covariates) in analyses with ASI composites were: age, ethnicity (Caucasian *v*. African American/other), marital status (married *v*. not married), years of education, number of lifetime drug-treatment episodes, age of onset of heroin use, and number of days used cocaine during past 30 days.