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Gender Differences in Psychotic Disorders with Concurrent Substance Use

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Abstract

Objective—We conducted a comparative analysis of gender differences in patients with primary psychotic disorders with concurrent substance use and in those with substance-induced psychoses.

Methods—A total of 385 individuals admitted to psychiatric emergency departments with early onset psychosis and recent substance use were interviewed at baseline and at 6-month intervals for two years. Using a standardized research diagnostic assessment instrument, we classified patients at baseline into primary and substance-induced psychosis groups and analyzed the effects of gender on demographic, family, and clinical characteristics at baseline, the interaction of gender and diagnosis, and gender main effects on illness course, adjustment, and service use over the two-year follow-up period.

Results—Women had better premorbid adjustment, less misattribution of symptoms, and a later age of onset of regular drug use compared to men. Women, however, showed greater depression and histories of abuse compared to men. Men had greater arrest histories. No interactions between gender and diagnosis were significant. Both genders in the primary and substance-induced psychosis groups showed clinical and functional improvement over the follow-up period despite the overall minimal use of mental health and substance abuse treatment services.

Conclusions—Women and men with psychosis and substance use differ on several dimensions. Our findings suggest the need for gender-specific treatment programming across both diagnostic groups.

Keywords

primary psychosis; substance-induced psychosis; gender differences

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DISCLOSURES

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Substance use is increasingly common among patients of both genders who present for treatment with recent onset of psychotic symptoms in urban centers where both licit and illicit substances are widely available (Regier et al., 1990; Strakowski et al., 1993; Sim et al., 2004; Cantwell et al., 1999). Scientific understanding of psychosis and substance use comorbidity has been increasing, but similarities and differences in patients with primary psychotic disorders who use substances and those with a substance-induced psychosis remain poorly understood. Women with schizophrenia tend to have a later age of onset of the disorder, experience better long-term functioning, and have fewer hospitalizations compared to men with schizophrenia (Goldstein & Tsuang, 1990; Hafner et al., 1993; Hafner, 2003; Thornicroft et al., 2002; Ochoa et al., 2012), but gender differences in people with a substance-induced psychosis have been studied very little. Given the importance of gender differences that have emerged from prior studies of schizophrenia, the implications of gender for understanding the onset, course, and treatment of all types of psychotic disorders that occur with the use of alcohol or drugs is warranted.

Schizophrenia is the most common of the primary psychotic disorders (Kessler et al., 2005). Studies of people with schizophrenia have consistently found that men have an earlier age of illness onset, poorer pre-morbid functioning, worse social functioning, and greater overall impairment compared to women (Goldstein & Tsuang, 1990; Hafner, 2003; Thornicroft et al., 2002; Ochoa et al., 2012; Thorup et al., 2013; Bertani et al., 2012). In addition, some studies have shown that men have more negative symptoms and women have more affective symptoms (Thorup et al., 2013; Bertani et al., 2012). Women with schizophrenia are typically more likely than men to be involved in conjugal relationships, parenting (Thornicroft et al., 2002), and employment (Thorup et al., 2013). Although substance use disorders are common among people with schizophrenia, women with schizophrenia, like those in the general population, use substances in smaller amounts and are less likely to carry a diagnosis of substance use disorder compared to men (Regier et al., 1990; McCreddie, 2002). It is not known whether there are gender differences in people with substance-induced psychotic disorder, and if so, whether they parallel gender differences in people with schizophrenia.

This paper is a comparative analysis of gender differences in people with primary psychotic disorders with concurrent substance use and those with substance-induced psychoses. Gender differences at baseline admission for treatment of recent onset psychosis and at outcome two years later are presented.

METHODS

We studied 385 patients with early-phase psychosis and concurrent substance use admitted to one of five psychiatric emergency departments in New York City. In a detailed baseline assessment that included a research diagnostic interview carried out within five weeks of the emergency department admission, patients were classified into primary psychosis and substance-induced psychosis groups. Study subjects were then interviewed every 6 months for a two-year period. In the analysis reported here, we compare the two genders in the primary psychosis and substance-induced psychosis groups on demographic, family, and

clinical characteristics at baseline and on illness course, adjustment, and service use over the two-year follow-up period.

Study subjects were recruited from the psychiatric emergency departments serving a catchment area of approximately 900,000 residents of upper Manhattan. Many neighborhoods in this region are low income and have high percentages of ethnic minorities. Study subjects, identified during a crisis admission in the psychiatric emergency department, were recruited for the study when they were clinically stable and able to give voluntary informed consent. For about three-quarters of study subjects, this occurred after transfer to an inpatient service. Those treated in the emergency department and released to the community gave written informed consent prior to their discharge and were interviewed in their homes or in project offices shortly thereafter. Study subjects were English or Spanish speaking, between the ages of 17 and 45 years, had at least one psychotic symptom identified by the clinical staff, had used alcohol and/or drugs within the past 30 days, and had no psychiatric inpatient history prior to the last six months. All subjects meeting these criteria were considered for inclusion in the study. There was a complete discussion of the study protocol with potential participants, and written informed consent was obtained from those who agreed to participate in the study. The Institutional Review Boards of the New York State Psychiatric Institute/Columbia University Medical Center and the collaborating institutions from which study subjects were recruited approved and monitored the research.

Research Diagnostic Assessments

Research diagnoses were made using the Psychiatric Research Interview for Substance and Mental Disorders (PRISM) (Hasin et al., 1996), developed specifically to assess psychiatric and substance use comorbidity. A detailed description of the longitudinal procedures and use of the PRISM instrument in this study, including data sources and the DSM-IV diagnostic criteria for primary and substance-induced psychotic disorders and substance dependence, are described elsewhere (Caton et al., 2005; Drake et al., 2013). Masters' level clinicians served as interviewers for the PRISM and all other research assessments. A PRISM trainer reviewed each completed research diagnostic interview to ensure thoroughness and consistency. Diagnostic assessments reported here are based on computer-generated diagnostic algorithms applying DSM-IV criteria.

Demographic, Family, and Clinical Characteristics of Study Subjects

Demographic data, including marital and parental status and information on education, age at admission for an early episode of psychotic symptoms, employment, and arrests, were obtained using the Community Care Schedule (Caton, 1997).

Data on psychiatric symptoms were assessed with the Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1992). This instrument has sub-scales yielding data on the positive symptoms of psychosis, negative symptoms, depression, and overall general psychopathology. The PRISM interview served as the source for information on the age at which a subject began using alcohol or drugs on a regular basis, defined as three or more times per week for a period of at least one month.

Psychosocial, educational, and occupational functioning in childhood, early adolescence, late adolescence, and adulthood were rated with the Premorbid Adjustment Scale (PAS) (Cannon-Spoor et al., 1982). The Scale to Assess Unawareness of Mental Disorders (SUMD) (Amador et al., 1993) was used to evaluate an individual's insight into having a mental illness. The instrument yields two scores: the unawareness of symptom score and the misattribution of symptoms score. The former assesses the awareness of the existence of a psychotic symptom, and the latter assesses the individual's understanding that a psychotic symptom is a manifestation of a mental illness. Subjects were given perfect scores on attribution for responses that indicated the individual knew that the symptom being rated was either due to a mental illness or caused by the use of drug(s) or alcohol (e.g., "I saw a vision because of the PCP I smoked"). Near perfect scores were also given for responses such as "my mind is playing tricks on me," "chemical imbalance," or "nervous breakdown." There was no requirement that the attribution had to match the DSM-IV diagnosis based on research diagnostic data. The World Health Organization Psychiatric Disability Schedule (WHO/DAS) was used to assess social and family problems. This instrument contains ratings on a 5-point scale from 1=no disability to 5=gross disability. WHO collaborators have reported high levels of inter-rater agreement on ratings of major social roles covered in the WHO/DAS: kappas were equal to or greater than 0.7 in 86% of comparisons, and equal to or greater than 0.8 in 60% of comparisons (World Health Organization, 1988).

Self-reported physical and sexual abuse experiences were assessed with the Sexual Abuse Exposure Questionnaire (Rodriguez et al., 1997). This instrument elicits information on history of physical and sexual abuse and recent partner abuse. A report of any event within each of these three domains was coded "yes."

Quality of life was assessed at six-month follow-up interviews using the Quality of Life Interview (Lehman, 1988). Service utilization, including days of psychiatric hospitalization, days of homelessness, and jail/prison experiences were recorded at follow-up interviews using the PRISM Timeline Grid (Hasin et al., 1996). Because of the large number of zeros on days of hospitalization and jail/prison experiences, these were treated as yes/no dichotomous variables.

Statistical Methods of Analysis

We compared men and women within each diagnostic category (primary psychosis and substance-induced psychosis) on the demographic, clinical, social, and treatment domains outlined previously. Descriptive statistics are presented for selected variables by gender within each diagnostic category. Depending on whether the measurement of a variable was categorical or scaled, we used the chi-square test or the t-test to determine statistical significance. We used two-way ANOVA (gender by diagnosis) for the analysis of clinical characteristics. All analyses were performed using SAS 9.3. Statistical significance was determined using 0.05 level and two-tailed tests of significance.

We used generalized estimating equations (GEE) (Liang & Zeger, 1986) to analyze longitudinal outcomes. GEE models correlated categorical and continuous outcomes with appropriate link function and probability distribution. GEE is an approach that handles the clustering effect due to repeated measures via its robust estimation property, and it

accommodates attrition and missing values, assuming data are missing completely at random. Gender, time (baseline, 6, 12, 18 and 24 months), and gender-by-time interactions were included in the model with the gender main effect across all time points including baseline.

RESULTS

Gender Composition

Men predominated in both diagnostic groups. Of the 217 subjects who received a diagnosis of primary psychotic disorder, 152 (70%) were men and 65 (30%) were women. One hundred sixty-eight subjects received a diagnosis of substance-induced psychosis, and in this group 125 (74%) were men and 43 (26%) were women.

Differences Observed at Admission to Treatment

The Primary Psychotic Disorder Group: Differences in Demographic and Family Characteristics—Table 1 shows gender comparisons on demographic and family domain variables for the primary psychosis group. Overall, most subjects were of minority status and had limited educational achievement. Women were older at admission compared to men, and they were more likely to be involved in conjugal and parental roles. Unemployment in both gender groups was high, but men were more likely to be employed than women. More women than men experienced sexual abuse. Men had greater jail/prison experiences. There were no gender differences in recent partner abuse.

The Primary Psychotic Disorder Group: Differences in Clinical Characteristics—Table 2 shows gender comparisons on clinical characteristics. Women had better premorbid adjustment scale scores compared to men, but their PANSS depression symptom scores were higher than those of their male counterparts. In addition, women had a higher rate of posttraumatic stress disorder compared to men. Men had a higher rate of drug dependence compared to their female counterparts. There were no gender differences in PANSS positive, negative, and general psychopathology symptom scores, SUMD unawareness of symptoms and misattribution of symptom scores, age of onset of regular drug use, antisocial personality disorder, or borderline personality disorder.

The Substance-Induced Psychosis Group: Differences in Demographic and Family Characteristics—Gender comparisons on demographic and family characteristics for the substance-induced psychosis group are shown in Table 3. Again, most subjects in both genders were of minority status and had limited educational achievement. The two gender groups were similar in age at admission, marital status, parental status, and employment. History of physical abuse was high in both gender groups, but women had a higher rate of histories of sexual abuse and recent partner abuse. Although nearly half of women had ever been in jail or prison, men had a higher rate of jail/prison experiences.

The Substance-Induced Psychosis Group: Differences in Clinical Characteristics—Table 4 shows gender comparisons on clinical characteristics. Women had better premorbid adjustment scores compared to men. The onset of regular drug use

began at a younger age for men. Drug dependence in both gender groups was high, but no gender differences existed. Women were more likely to have a diagnosis of posttraumatic stress disorder but there were no gender differences in any of the PANSS scores, SUMD scores, antisocial personality diagnoses, or borderline personality diagnoses.

Analysis of variance for clinical characteristics in both diagnostic groups revealed significant gender main effects with women having better premorbid adjustment compared to men ($\chi^2=10.46$; $p=0.001$), less misattribution of symptoms ($\chi^2=4.06$; $p<0.05$), and a later age of onset of regular drug use ($\chi^2=4.83$; $p<0.05$.) Women had greater impairment on PANSS depression scores compared to men ($\chi^2=5.13$; $p<0.05$).

No interactions between gender and diagnosis were significant.

Outcome at the Two-Year Follow-up

The Primary Psychotic Disorder Group—Tables 5–8 show gender main effects across all assessment points, time effect, and their interactions. Table 5 shows that patients in the primary psychosis group experienced improvement over the follow-up period in many areas, with lower rates of alcohol dependence, reduced positive and negative symptoms, and stronger social and family relationships. No improvement was observed in drug dependence, homelessness, jail/prison experiences, or quality of life. No gender main effect across all time points was observed. The significant group by time interaction for drug dependence reflects consistent reduction in drug use for men, but fluctuation for women over time

Service utilization by gender over the follow-up period is shown in Table 6. Primary psychosis patients experienced increased use of outpatient mental health treatment, visits to psychiatrists and psychiatric hospitalizations over the two-year period. However, this trend was not apparent in outpatient substance abuse treatment, dual disorders treatment, or visits to other physicians. Neither gender main effects nor group-by-time interactions were significant.

The Substance-Induced Psychosis Group—Outcome by gender over the two-year follow-up period is shown in Table 7. Patients in this diagnostic group showed improvement in many clinical and functional areas, including alcohol and drug dependence, positive and negative symptoms, jail/prison experiences, and social and family relationships. Homelessness and quality of life did not improve. No gender main effects were observed, but the gender-by-time interaction for positive symptoms showed that women experienced fewer symptoms over the follow-up period compared to men.

Service utilization by gender over the two-year period is shown in Table 8. Service use increased for outpatient substance abuse treatment, dual disorders treatment, psychiatric hospitalization, psychiatrist visits, and visits to other physicians, but no increase in outpatient mental health treatment was observed. Gender main effects and group-by-time interactions were not significant. Although substance abuse and dual disorders treatment increased over the two years, typically fewer than one in five of substance-induced psychosis patients received these services. The paucity of outpatient mental health and substance abuse treatment utilization may account for the increase in hospital use over time.

DISCUSSION

We studied gender differences in demographic, family, and clinical characteristics in patients with DSM-IV substance-induced psychosis and those with primary psychotic disorder and substance use comorbidity, using data from a longitudinal study of early phase psychosis and substance use comorbidity. In summary, women in both diagnostic groups had better premorbid adjustment, a less misattribution of symptoms, and a later age of onset of regular drug use compared to men. Women, however, showed greater impairment on PANSS depression scores compared to men. No gender main effects were observed in either diagnostic group over the follow-up period. The significant gender-by-time interaction for drug dependence in the primary psychosis group reflects reduced drug use among primary psychosis women over the two years of follow-up compared to men, and the significant gender-by-time interaction for positive symptoms in the substance-induced psychosis group indicates that women with this disorder experienced fewer positive symptoms in the follow-up period compared to their male counterparts.

Most gender differences found at admission to treatment (baseline) in the primary psychosis group were similar to prior investigations of the topic. Women with primary psychotic disorder had a later age of admission, better premorbid adjustment, and greater involvement in marital and parental roles compared to men. Women also had greater depression, history of sexual abuse, and posttraumatic stress disorder. Men, however, were more likely to be employed at baseline.

In contrast to the gender differences observed in the primary psychotic disorder group, baseline gender differences in the substance-induced group were distinctive. Although women in the substance-induced psychosis group had better premorbid adjustment compared to men, there were no gender differences in age at admission or current social functioning. Women with substance-induced psychoses had greater histories of sexual abuse, current partner abuse, and posttraumatic stress disorder. While factors associated with better premorbid adjustment and the later age of onset of regular drug use for women require further study and evaluation, regular drug use could be associated with social or partner relationships that also involved drug use. Despite the fact that women began regular drug use at a later age than men, women matched their male counterparts on diagnoses of substance dependence.

The absence of a gender main effect in the follow-up period in the primary psychosis group was unexpected, given the findings from many prior studies indicating that women with schizophrenia have better overall outcomes compared to men. In a two-year follow-up of a Spanish first-episode schizophrenia cohort similar findings were observed, leading the authors to conclude that the influence of gender on the early course of schizophrenia does not seem to determine the clinical or functional outcome of this disorder (Segarra et al., 2012). We acknowledge, however, that the illness course and outcome of our sample of women with psychosis and substance use comorbidity, depression, and histories of abuse could be seriously compromised by their greater pathology and disadvantaged lives.

Both genders in the primary psychosis and substance-induced psychosis groups showed clinical and functional improvement over the follow-up period despite their overall minimal use of mental health and substance abuse treatment services. The better premorbid functioning among women in both diagnostic groups is of interest. Allen et al. (2013) have noted the value of closer study of academic and social premorbid impairment across developmental periods to better understand gender differences in the course of premorbid impairment prior to the onset of psychotic disorder. The role of substance use in academic and social deterioration in the prodromal phase of psychotic illness is worthy of further study.

These study findings have critical implications for treatment. Despite having the advantages of a later onset of psychosis and better premorbid functioning, the greater comorbidity with depression and posttraumatic stress disorder found among women with primary psychotic disorders who use drugs and alcohol underscores the need for gender-specific treatment programming, especially given their greater involvement in conjugal and parental roles. In addition to a focus on treatment of substance abuse, such programs should address conjugal and parenting relationships, primary care needs, and stress management. Gender specific interventions for women with substance-induced psychotic disorders are also warranted to address their greater vulnerability to current partner abuse and posttraumatic stress disorder. The greater number of jail/prison episodes experienced by men in both diagnostic groups suggests that treatment services for psychiatric disorder and substance abuse be made available within the criminal justice system.

Limitations

This study has several limitations. Study subjects were drawn from upper Manhattan emergency departments serving low-income catchment areas. These characteristics, in addition to the comorbidity found in our study sample, limit the generalizability of study findings. Psychosis and substance use comorbidity is more common in males and this condition is associated with a worse clinical course. It is possible that when men and women with primary psychosis and substance use comorbidity are compared, the sample is less representative of the population of women with schizophrenia than men, accounting for fewer gender differences over the follow-up period. Moreover, treatment efficacy cannot be inferred from this naturalistic study of patterns of service use.

Conclusions

In summary, gender differences found at admission to treatment in the primary psychosis group were similar to prior investigations of the topic. In contrast, gender differences in the substance-induced psychosis group were unique, adding to the validity of the diagnostic distinction between primary and substance-induced psychotic disorders. Overall, this study of people with psychotic disorder who also used drugs and alcohol reveals the association between substance abuse and the social and clinical functioning of both men and women. Women in both groups were more likely to be victims and to internalize problems on the context of family relationships. Men, on the other hand, were more likely to be aggressive and become entangled with the criminal justice system. Continued study of psychoses with

concurrent substance use could further enlighten gender differences in the illness course and outcome of these disorders.

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Table 1Baseline Demographic and Family Characteristics in Primary Psychosis Group ($n=217$)

Characteristic	Male ($n=152$) n (%)	Female ($n=65$) n (%)	p -value
Age at Admission ($M \pm SD$)	26.2 $\pm$ 7.8	29.5 $\pm$ 8.8	<.01
Marital Status (Ever Married)	16 (10.6)	24 (38.1)	<.0001
Has Children	34 (22.0)	36 (56.3)	<.0001
Race			NS
Black	68 (44.7)	27 (41.5)	
Hispanic	54 (35.5)	30 (46.2)	
White/Others	30 (19.7)	8 (12.3)	
Education (High School or Higher)	91 (60.0)	33 (50.8)	NS
Currently Employed	51 (40.2)	14 (23.7)	<.05
History of Physical Abuse	97 (64.2)	42 (65.6)	NS
History of Sexual Abuse	52 (34.4)	40 (61.5)	<.001
Recent Partner Abuse	36 (23.8)	17 (26.2)	NS
Jail/Prison	93 (61.2)	19 (29.2)	<.0001

Note. NS = not significant.

Table 2Baseline Clinical Characteristics and Comorbidity in Primary Psychosis Group ($n=217$)

	Male ($n=152$)	Female ($n=65$)	<i>p</i> -value
Clinical Characteristic	$M \pm SD$	$M \pm SD$	
Premorbid Adjustment	.36 $\pm$.19	.29 $\pm$.16	<.02
Positive Symptoms	19.1 $\pm$ 6.9	17.6 $\pm$ 8.0	NS
Negative Symptoms	14.3 $\pm$ 6.2	13.8 $\pm$ 6.3	NS
General Psychopathology Symptoms	33.3 $\pm$ 10.4	33.5 $\pm$ 10.7	NS
Depression Symptoms	10.8 $\pm$ 4.9	12.1 $\pm$ 3.9	<.05
Unawareness of Symptoms	9.7 $\pm$ 9.2	8.3 $\pm$ 10.3	NS
Misattribution of Symptoms	9.4 $\pm$ 8.5	7.1 $\pm$ 8.1	NS
Age Onset of Regular Drug Use	17.3 $\pm$ 4.1	17.6 $\pm$ 5.4	NS
Comorbidity	n (%)	n (%)	
Antisocial Personality Disorder	15 (9.9)	4 (6.2)	NS
Borderline Personality Disorder	11 (7.2)	4 (6.2)	NS
Posttraumatic Stress Disorder	17 (11.2)	15 (23.1)	<.05
Drug Dependence	51 (33.5)	8 (12.3)	<.01

Note. NS = not significant.

Table 3Baseline Demographic and Family Characteristics in Substance-Induced Psychosis Group ($n=168$)

Characteristic	Male ($n=125$) n (%)	Female ($n=43$) n (%)	p -value
Age at Admission ($M \pm SD$)	30.2 $\pm$ 8.4	29.6 $\pm$ 8.2	NS
Marital Status (Ever Married)	43 (35.0)	12 (28.0)	NS
Has Children	63 (50.8)	25 (59.5)	NS
Race			NS
Black	49 (39.2)	23 (53.5)	
Hispanic	63 (50.4)	15 (34.8)	
White/Others	13 (10.4)	5 (11.6)	
Education (High School or Higher)	57 (45.6)	25 (58.1)	NS
Currently Employed	37 (37.8)	11 (32.4)	NS
History of Physical Abuse	90 (73.2)	26 (60.5)	NS
History of Sexual Abuse	42 (34.2)	25 (58.1)	<.01
Recent Partner Abuse	35 (28.5)	22 (51.2)	<.01
Jail/Prison	94 (75.2)	20 (46.5)	<.01

Note. NS = not significant.

Table 4Baseline Clinical Characteristics and Comorbidity in Substance-Induced Psychosis Group ($n=168$)

	Male ($n=125$)	Female ($n=43$)	<i>p</i> -value
Clinical Characteristics	$M \pm SD$	$M \pm SD$	
Premorbid Adjustment	.33 $\pm$.17	.26 $\pm$.16	<.05
Positive Symptoms	14.1 $\pm$ 5.4	14.8 $\pm$ 5.4	NS
Negative Symptoms	11.8 $\pm$ 4.7	11.6 $\pm$ 4.8	NS
General Psychopathology Symptoms	28.2 $\pm$ 6.9	29.6 $\pm$ 6.8	NS
Depression Symptoms	10.0 $\pm$ 3.7	11.0 $\pm$ 4.4	NS
Unawareness of Symptoms	6.1 $\pm$ 9.4	3.9 $\pm$ 5.1	NS
Misattribution of Symptoms	5.2 $\pm$ 5.7	4.1 $\pm$ 4.5	NS
Age Onset of Regular Drug Use	17.9 $\pm$ 6.0	20.8 $\pm$ 7.3	<.05
Comorbidity	<i>n</i> (%)	<i>n</i> (%)	
Antisocial Personality Disorder	24 (19.2)	4 (9.3)	NS
Borderline Personality Disorder	15 (12.0)	8 (18.6)	NS
Posttraumatic Stress Disorder	21 (16.8)	15 (34.9)	<.02
Drug Dependence	78 (62.4)	28 (65.1)	NS

Note. NS = not significant.

Table 5

Outcomes by Gender Over Two Years for Primary Psychosis Patients

Participant Totals	Baseline	6-month		12-month		18-month		24-month		Level of Significance		
		152	127	119	117	110	52*	Average Gender	Average Time	Average	by Time	Group
Males	65	59	55	54	52							
Females												
Variables												
Alcohol Dependence	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	0.1038	0.0028	0.8847		
Males	42 (27.6%)	20 (16.8%)	15 (13.6%)									
Females	13 (20.0%)	5 (9.1%)	4 (7.7%)									
Drug Dependence								0.0784	0.0623	0.0082		
Males	51 (33.6%)	23 (19.3%)	18 (16.4%)									
Females	8 (12.3%)	10 (18.2%)	5 (9.6%)									
Homelessness								0.4461	0.1446	0.2811		
Males	17 (11.8%)	10 (7.9%)	9 (7.6%)	7 (6.0%)	8 (7.3%)							
Females	5 (7.7%)	7 (11.9%)	5 (9.1%)	2 (3.7%)	1 (1.9%)							
Jail/Prison								0.5762	0.3625	0.5246		
Males	16 (10.5%)	8 (6.3%)	6 (5.1%)	5 (4.3%)	5 (4.6%)							
Females	3 (4.6%)	5 (8.5%)	3 (5.4%)	2 (3.7%)	1 (1.9%)							
Mean $\pm$ SD		Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD					
Positive Symptoms								0.8522	<.0001	0.5765		
Males	19.1 $\pm$ 6.9	13.3 $\pm$ 5.9	13.3 $\pm$ 6.1	12.2 $\pm$ 5.8	12.4 $\pm$ 6.2							
Females	17.7 $\pm$ 8.0	13.0 $\pm$ 6.6	13.3 $\pm$ 5.9	12.7 $\pm$ 6.6	12.8 $\pm$ 7.3							
Negative Symptoms								0.4169	<.0001	0.9292		
Males	14.3 $\pm$ 6.2	12.9 $\pm$ 5.8	12.7 $\pm$ 6.2	11.9 $\pm$ 5.5	11.9 $\pm$ 5.3							
Females	13.8 $\pm$ 6.3	12.8 $\pm$ 5.4	11.8 $\pm$ 5.3	11.3 $\pm$ 4.5	11.1 $\pm$ 4.5							
Quality of Life								0.7248	0.8926	0.8141		
Males		9.3 $\pm$ 3.0	9.4 $\pm$ 3.2	9.3 $\pm$ 2.7	9.4 $\pm$ 2.9							
Females		9.4 $\pm$ 2.5	9.1 $\pm$ 3.1	9.1 $\pm$ 2.7	9.4 $\pm$ 2.5							
Social Relationships								0.5364	<.0001	0.5157		
Males	2.5 $\pm$ 1.5	1.9 $\pm$ 1.5	1.6 $\pm$ 1.4	1.8 $\pm$ 1.4	1.6 $\pm$ 1.4							
Females	2.3 $\pm$ 1.4	1.9 $\pm$ 1.4	1.7 $\pm$ 1.3	1.5 $\pm$ 1.2	1.5 $\pm$ 1.4							

Participant Totals	Baseline	6-month	12-month	18-month	24-month	Level of Significance		
						Average Gender	Average Time	Group by Time
Males	152	127	119	117	110	52*	54	55
Females	65	59	55	54	52*	54	55	55
Variables						Difference	Trend	Interaction
Family Relationships								
Males	3.0±1.4	2.4±1.5	2.2±1.4	1.9±1.4	1.9±1.5	0.8210	<.0001	0.5815
Females	2.8±1.4	2.4±1.6	2.3±1.5	2.0±1.3	1.7±1.4			

* Total n varies within each time period due to missing data.

Table 6

Services Utilization by Gender Over Two Years for Primary Psychosis Patients

Participant Totals		Baseline	6-month	12-month	18-month	24-month	Level of Significance	
Males	Females	152	127	119	117	110	Average Gender Difference	Average Time by Time Interaction
Variables		65	59	55	54	52*	Trend	Interaction
Outpatient Mental Health Treatment		<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	0.2281	<.0001
Male		14 (9.2%)	30 (23.6%)	23 (19.5%)	29 (24.8%)	28 (25.5%)		
Female		6 (9.2%)	16 (27.1%)	16 (29.1%)	16 (29.6%)	21 (40.4%)		
Outpatient Substance Abuse Treatment							0.7315	0.7293
Male		3(2.0%)	4 (3.2%)	4 (3.4%)	6 (5.1%)	2 (1.8%)		
Female		3 (4.6%)	2 (3.4%)	1 (1.8%)	2 (3.7%)	3 (5.8%)		
Outpatient Dual Disorders Treatment							0.7425	0.0823
Male		12 (7.9%)	15 (11.8%)	17 (14.4%)	15 (12.8%)	19 (17.3%)		
Female		6 (9.2%)	9 (15.3%)	7 (12.7%)	4 (7.4%)	7 (13.5%)		
Psychiatric Hospitalization							0.3162	0.0012
Male		7 (4.6%)	12 (9.5%)	8 (6.8%)	12 (10.3%)	12 (10.9%)		
Female		2 (3.1%)	15 (25.4%)	7 (12.7%)	7 (13.0%)	6 (11.5%)		
Outpatient Psychiatrists							0.2066	<.0001
Male		37 (24.3%)	84 (66.1%)	67 (56.8%)	70 (59.8%)	68 (61.8%)		
Female		25 (38.5%)	40 (67.8%)	38 (69.1%)	34 (63.0%)	32 (61.5%)		
Outpatient Other Physicians							0.1004	0.1525
Male		23 (15.1%)	21 (16.5%)	22 (18.6%)	27 (23.1%)	26 (23.6%)		
Female		14 (21.5%)	14 (23.7%)	17 (30.9%)	13 (24.1%)	17 (32.7%)		

* Total *n* varies within each time period due to missing data.

Table 7

Outcomes by Gender Over Two Years for Substance-Induced Psychosis Patients

Participant Totals	Baseline	6-month			12-month			18-month			24-month			Level of Significance		
		n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	Average Gender	Average Time	Group by Time
Males	125	98	34	31	90	86	81	30	30*	30*	23 (28.4%)	4 (13.3%)	33 (40.7%)	0.0717	<.0001	0.4673
Females	43															
Variables														Difference	Trend	Interaction
Alcohol Dependence																
Males	70 (56.0%)				35 (38.9%)						23 (28.4%)					
Females	17 (39.5%)				10 (32.3%)						4 (13.3%)					
Drug Dependence														0.7810	<.0001	0.6715
Males	78 (62.4%)				42 (46.7%)						33 (40.7%)					
Females	28 (65.1%)				14 (45.2%)						10 (33.3%)					
Homelessness														0.1575	0.1243	0.8533
Males	28 (22.4%)	21 (21.4%)			17 (19.0%)	9 (10.5%)					7 (8.6%)					
Females	5 (11.6%)	5 (14.7%)			3 (9.7%)	1 (3.3%)					1 (3.3%)					
Jail/Prison														0.3915	0.0483	0.4302
Males	14 (11.2%)	8 (8.2%)			13 (14.4%)	12 (14.0%)					9 (11.1%)					
Females	1 (2.3%)	2 (5.9%)			5 (16.1%)	3 (10.0%)					4 (13.3%)					
	Mean $\pm$ S	Mean $\pm$ SD			Mean $\pm$ SD	Mean $\pm$ SD					Mean $\pm$ SD					
Positive Symptoms														0.5076	<.0001	0.0493
Males	14.1 $\pm$ 5.4	11.2 $\pm$ 4.9			11.0 $\pm$ 5.2	10.0 $\pm$ 3.4					10.3 $\pm$ 3.2					
Females	14.8 $\pm$ 5.4	11.5 $\pm$ 3.6			10.4 $\pm$ 3.8	8.5 $\pm$ 2.0					9.4 $\pm$ 3.4					
Negative Symptoms														0.4241	<.0001	0.4748
Males	11.8 $\pm$ 4.8	11.4 $\pm$ 4.7			10.3 $\pm$ 3.7	10.4 $\pm$ 3.6					10.2 $\pm$ 3.8					
Females	11.6 $\pm$ 4.8	10.7 $\pm$ 4.1			9.6 $\pm$ 2.7	10.9 $\pm$ 4.2					8.9 $\pm$ 1.9					
Quality of Life														0.1671	0.1037	0.4698
Males		9.8 $\pm$ 2.9			9.9 $\pm$ 2.8	9.7 $\pm$ 2.8					10.2 $\pm$ 2.4					
Females		8.2 $\pm$ 2.9			9.5 $\pm$ 2.8	9.0 $\pm$ 3.3					10.0 $\pm$ 3.3					
Social Relationships														0.5187	<.0001	0.6319
Males	2.6 $\pm$ 1.5	1.7 $\pm$ 1.4			1.6 $\pm$ 1.4	1.5 $\pm$ 1.3					1.3 $\pm$ 1.3					
Females	2.4 $\pm$ 1.6	2.0 $\pm$ 1.4			1.5 $\pm$ 0.9	1.1 $\pm$ 1.2					1.1 $\pm$ 1.3					

Participant Totals	Baseline	6-month	12-month	18-month	24-month	Level of Significance		
						Average Gender	Average Time	Group by Time
Males	125	98	90	86	81			
Females	43	34	31	30	30*			
Variables						Difference	Trend	Interaction
Family Relationships								
Males	2.6±1.4	2.1±1.5	1.9±1.4	1.9±1.3	1.6±1.2	0.9521	<.0001	0.1874
Females	3.0±1.3	2.3±1.6	2.1±1.2	1.8±1.4	1.3±1.0			

* Total n varies within each time period due to missing data.

Table 8
Services Utilization by Gender Over Two Years for Substance-Induced Psychosis Patients

Participant Totals		Baseline		6-month		12-month		18-month		24-month		Level of Significance	
		125	98	90	86	81	Average Gender	Average Time	Group by Time				
Variables		43	34	31	30	30*							
Outpatient Mental Health Treatment	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)							
Male	9 (7.2%)	10 (10.2%)	7 (7.8%)	6 (7.0%)	3 (3.7%)								
Female	1 (2.3%)	5 (14.7%)	4 (12.9%)	3 (10.0%)	2 (6.7%)								
Outpatient Substance Abuse Treatment													
Male	6 (4.8%)	11 (11.2%)	12 (13.3%)	12 (14.0%)	9 (11.1%)								
Female	2 (4.7%)	3 (8.8%)	3 (9.7%)	5 (16.7%)	3 (10.0%)								
Outpatient Dual Disorders Treatment													
Male	7 (5.6%)	12 (12.2%)	14 (15.6%)	11 (12.8%)	10 (12.4%)								
Female	1 (2.3%)	7 (20.6%)	5 (16.1%)	5 (16.7%)	5 (16.7%)								
Psychiatric Hospitalization													
Male	1 (1.0%)	3 (3.1%)	2 (2.2%)	7 (8.1%)	8 (10.0%)								
Female	1 (2.3%)	3 (8.8%)	2 (6.5%)	3 (10.0%)	2 (6.7%)								
Outpatient Psychiatrists													
Male	20 (16.0%)	30 (30.6%)	27 (30.0%)	22 (26.0%)	23 (28.4%)								
Female	6 (14.0%)	14 (41.2%)	10 (32.3%)	11 (36.7%)	13 (43.3%)								
Outpatient Other Physicians													
Male	12 (9.6%)	16 (16.3%)	16 (17.8%)	14 (16.3%)	16 (22.2%)								
Female	6 (14.0%)	6 (17.7%)	7 (22.6%)	9 (30.0%)	11 (36.7%)								

* Total *n* varies within each time period due to missing data.