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Heterogeneity of mental health service utilization and high mental health service use among women eight years after initiating substance use disorder treatment

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Abstract

Objective—To determine mental health service utilization patterns among women treated for substance use disorders (SUD) and identify factors associated with patterns of high mental health service use.

Methods—Data were provided by 4,447 women treated for SUD in California during 2000–2002 for whom mental health services utilization records were acquired. A latent class model was fitted to women's high use of services (≥ 6 services/year over 8 years). Multinomial logistic regression was used to identify predisposing, enabling, and need factors associated with utilization patterns.

Results—In 8 years after initiating SUD treatment, 50% of women utilized mental health services. High use probability was consistently low for most women (76.9%); for others, however, it decreased immediately following SUD treatment and then increased over time (9.3%), increased immediately following SUD treatment and then decreased (8.7%), or remained consistently high (5.1%). Consistently high services use was negatively associated with marriage (OR 0.60, $p<0.05$) and employment (OR 0.53, $p<0.05$) and positively associated with older age (OR 1.04, $p<0.001$), homelessness (OR 1.68, $p<0.05$), public assistance (OR 1.76, $p<0.01$), outpatient SUD treatment (OR 3.69, $p<0.01$), longer SUD treatment retention (OR 1.00, $p<0.01$), treatment desire (ORs 1.46, $p<0.001$), and co-occurring disorder diagnosis (ORs 2.89–44.93, $p<0.001$). Up to 29% of women with co-occurring mental health disorders at SUD treatment entry did not receive any mental health treatment in the subsequent 8 years.

Conclusions—Mental health services utilization patterns among women treated for SUD are heterogeneous and dynamic. Understanding factors related to women's utilization patterns may aid efforts to optimize care and ensure appropriate use of mental health services.

Keywords

women with co-occurring mental health and substance use disorders; utilization of mental health services; high use of mental health services; latent class analysis; longitudinal study design

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1. Introduction

An estimated 40%–70% of women treated for substance use disorders (SUD) have depression, anxiety, or another mental illness (Greenfield et al., 2007; Greenfield & Grella, 2009; Substance Abuse and Mental Health Services Administration [SAMHSA], 2009; Tuchman, 2010). The co-occurrence of mental health disorders and substance use disorders (COD) among women is a well-established predictor of relapse to substance abuse after treatment, morbidity, and premature death (Greenfield & Grella, 2009; Hser, Kagihara, Huang, Evans & Messina, 2012; Institute of Medicine, 2005; SAMHSA, 2009; Tuchman, 2010).

COD can be treated effectively when treatment structure, intensity, and duration is commensurate with the complexity and acuity of clients' disorders. (Kessler, 2004; McGovern, Matzkin, & Giard 2007, Drake, O'Neal, & Wallach, 2008). However, the majority of individuals in SUD treatment do not receive care that is designed to address COD (McGovern, Lambert-Harris, McHugo, Giard, & Mangrum, 2010; Drake & Bond, 2010; McGovern, Lambert-Harris, Gotham, Clause, & Xie, 2014). Consequently, most individuals in SUD treatment settings who have COD must utilize the mental health system in order to receive psychiatric care. However, there is significant concern that individuals with COD either do not access mental health services, or utilize them in an inefficient and unnecessarily costly manner.

Nationwide, only 7.7% of individuals aged 18 or older with COD receive both mental health and SUD services (Substance Abuse and Mental Health Services Administration, 2014). Many individuals with COD who are in SUD treatment do not receive mental health care because SUD treatment providers inadequately evaluate clients for mental illness (Arria & McLellan, 2010; Tuchman, 2010; Bright, Osborne, & Greif, 2011; Greenfield & Grella, 2009; Lambert-Harris, Saunders, McGovern, & Xie, 2013; McGovern et al., 2014). Moreover, when SUD providers are able to identify clients' mental health needs, the isolation of SUD treatment settings from mental health systems makes it difficult to link clients to mental health services. (Arria & McLellan, 2010; Buck, 2011). Conversely, among individuals in SUD treatment who do access mental health services, excessively high use may lead to excess costs and inappropriate use of scarce mental health treatment resources (Kent, Fogarty, & Yellowlees, 1995; Pasic, Russo, & Roy-Byrne 2005; Stanton 2006; Lindamer et al., 2012; Center for Medicare & Medicaid Services, 2013; Maclean, Xu, French, & Ettner, 2014). Consequently, research is needed to better understand mental health utilization patterns of individuals who receive SUD treatment.

Improved understanding of the factors associated with both utilization and high use of mental health services can be used to assure that SUD clients who would benefit from frequent and intensive mental health services have access to them, and that those who do not require these services do not inappropriately utilize them. In particular, research is needed to enhance understanding of these issues as they pertain to women in SUD treatment, since women have high levels of mental health service need and have traditionally been underrepresented in studies of SUD treatment populations (Brady & Ashley, 2005; Greenfield et al., 2007).

1.1. Factors associated with utilization of mental health services

The Behavioral Model of Health Services Use (Aday & Andersen, 1974; Andersen, 1995; Andersen, 2008) for vulnerable populations (Gelberg, Andersen, & Leake, 2000) suggests that health service utilization is a function of perceived and evaluated need for care, predisposition to use services, and factors that enable or impede use. COD diagnosis is a key determinant of mental health service utilization (Lindamer et al., 2012; Goldstein & Levitt, 2006; Grella, Greenwell, Mays, & Cochran, 2009; Min, Biegel, & Johnsen, 2005; Rosen, Tolman, & Warner, 2004; Ross, Lin, & Cunningham, 1999; Wu, Kouzis, & Leaf, 1999). Mental health service utilization is also known to be influenced by the recency of the assessed mental health diagnosis (Bigelow, McFarland, McCamant, Deck, & Gabriel, 2004; Druss et al., 2007) and the severity of COD, as indicated by COD disorder type (Mackenzie, Reynolds, Cairney, Streiner, & Sareen, 2012) or the presence of multiple comorbid mental health disorders (Frise, Steingart, Sloan, Cotterchio, & Kreiger, 2002). It is also well-known that mental health services are more likely to be received when patients perceive a need for care (Koegel, Sullivan, Burnam, Mortan & Wenzel, 1999; Urbanoski, Cairney, Bassani, & Rush, 2008; Watkins, Burnam, Kung, & Paddock, 2001). The few studies that have identified salient enabling factors have reported the use of mental health services to be positively associated with homelessness (Lindamer et al., 2012), health insurance (Lindamer et al., 2012; Weaver et al., 2008), and Medicaid enrollment (Weaver et al., 2008).

Other research has focused on identifying factors that are associated with high use of mental health services. Studies have highlighted the association of high use of mental health services with psychotic disorders (Roick et al., 2004; Lindamer et al., 2012; Vandyk, Harrison, VanDenKerkhof, Graham, & Ross-White, 2013), schizophrenia (Chaput & Lebel, 2007; Lindamer et al., 2012; Graca, Klut, Traneas, Borja-Santos, & Cardoso, 2013), developmental delays (Pasic et al., 2005), personality disorders (Vandyk, VanDenKerkhof, Graham, & Harrison, 2014) and challenges related to substance use (Lindamer et al., 2012; Vandyk et al., 2014). Homelessness or transient accommodations (Morlino et al., 2011; Lindamer et al., 2012; Vandyk et al., 2013), and poor social and economic supports (Pasic et al., 2005; Chaput & Lebel, 2007; Vandyk et al., 2014) are also associated with high use of mental health services.

Taken together, these findings suggest there are ways in which mental health service utilization is correlated with the evaluated and perceived need for care, and may also be influenced by socio-demographic characteristics and resources that support access to health care.

1.2. Limitations of current knowledge

There are several limitations of current knowledge concerning utilization of mental health services and high mental health service use among women who receive SUD treatment. Extant literature in this area generally does not focus on individuals receiving SUD treatment in spite of the high rates of mental health service need among this population. Furthermore, the little research that does examine SUD treatment populations (e.g., Hser, Grella, Evans, & Huang, 2006) typically does not focus on women. Given the high rates of COD among women in SUD treatment settings and the distinctive challenges they face

(Brady & Ashley, 2005; Brady, Back, & Greenfield, 2009; SAMHSA, 2009; Greenfield et al., 2007; Tuchman et al., 2010), it is critical to understand what factors improve womens' access to mental health care and what makes them likely to be high users of mental health services.

Moreover, the majority of studies that focus on high mental health service use only measure use during a period of one year or less (Vandyk et al., 2013). Yet both mental health disorders and SUD are chronic conditions that may require clients to receive different amounts of services over many years and from different providers (Hser, Anglin, Grella, Longshore, & Prendergast, 1997; Hser, Hoffman, Grella, & Anglin, 2001; Judd et al., 2000; Judd, et al., 2003; McLellan, 2002; Chi & Weisner, 2008). Consequently, further research that examines the long-term use of mental health services among SUD treatment populations is needed.

1.3. The present study

Drawing on the aforementioned Behavioral Model of Health Services Use, we utilize a sample of women followed for 8 years after entering SUD treatment to examine the following research questions: (1) at entry into SUD treatment, how are women with COD different from women with only SUD in demographic characteristics, key life experiences, and SUD treatment experiences, (2) by COD diagnostic type, is there variation in women's utilization of mental health services after SUD treatment entry, (3) are certain need, predisposing, or enabling factors associated with different long-term patterns of high mental health service use?

2. Materials and methods

Data were provided by the California Treatment Outcome Project (CalTOP). CalTOP recruited approximately 17,770 adults admitted to 43 SUD treatment programs in 13 California counties during 2000–2002 (Hser, Evans, Huang, & Anglin, 2004; Evans & Hser, 2004). A prospective study (Evans, Li, Pierce, & Hser, 2013; Evans, Li, Buoncristiani, & Hser, 2014; Hser, Evans, & Huang, 2011) obtained data in 2009 on mental health services utilized by 4,447 CalTOP women from the California Department of Mental Health (DMH), which tracks psychiatric diagnoses and services provided by public mental health facilities. Study procedures were approved by Institutional Review Boards at UCLA and the California Health and Human Services Agency.

2.1. Participants

The study sample of 4,447 women is 55.5% white, 22.1% Hispanic, 16.4% African American, and 6.0% Asian/other race/ethnicity. Mean age at baseline was 34.5 ($\pm$ 7.8). Approximately 42% had not attained a high school education, 22% were employed, 37% received public assistance, and more than half had been physically/sexually abused. Methamphetamine was the predominant problem substance (40%) and the women had several prior SUD treatments.

2.2. Measures

The primary *dependent variables* for this study were mental health service utilization and high mental health service use over eight years after treatment entry, which was the maximum period of time that could be calculated using available data. Currently, there is no consensus on what criteria should be used to define high use of mental health services (Kent et al., 1995; Junghan & Brenner, 2006; Vandyk, Harrison, VenDenkerkhof, Graham, & Ross-White, 2013). Several studies define high use by quantifying how many mental health service episodes occur in a time period ranging from three months to fifteen years (Roick et al., 2004; Pasic et al., 2005; Chaput & Lebel, 2007; Broadbent, Kydd, Sanders, & Vanderpyl, 2008; Morlino et al., 2011; Lindamer et al., 2012; Graca et al., 2013; Hundt et al., 2014; Vandyk et al., 2014). Others have determined who is a high user by using formulas that calculate which individuals account for a disproportionate number of mental health episodes or total days of service compared to the total population of mental health service utilizers (Harrison-Read et al., 2002; Junghan & Brenner, 2006; Vandyk et al., 2013).

We determined high mental health service use by combining these approaches, as informed by studies that have focused on populations with SUD (Lindamer et al., 2012; Ray, Weisner, & Mertens, 2005). First, we calculated the number of mental health services received per woman per year over an eight year period. Then we stratified the sample according to amount of mental health services received into four categories: zero, lowest one-third of nonzero distribution (mean=0.41), middle one-third (mean=2.77), and highest one-third (mean=27.71). We combined the two lowest nonzero groups to form three groups: no use of services, low-moderate use (>0 to 5 services per year), and high use (≥ 6 services per year).

The primary *independent variable* for this study is evaluated need defined by DMH diagnoses recorded during 12-months before SUD treatment entry. Following prior research (Chi, Satre, & Weisner, 2006; Jaffe, Du, Huang, & Hser, 2012; Ouimette, Gima, Moos, & Finney, 1999), we created 5 mutually exclusive categories - women who were diagnosed with: (1) psychosis (n=162; 3.6%), (2) bipolar disorder (n=233; 5.2%), (3) depression (n=486; 10.9%), (4) anxiety or another mental illness (n=308; 6.9%), and (5) SUD only, i.e., no co-occurring mental illness (n=3,258; 73.3%). Women with several mental health diagnoses (14.5%) were coded into the category of greatest severity, with psychosis considered to be the most severe disorder followed by bipolar disorder, depression, other, and only SUD (see Table 1 note).

Predisposing, enabling, and perceived need factors were provided by assessment at SUD treatment entry which included the Addiction Severity Index (ASI). The ASI captures demographic information and assesses problem severity in seven areas: alcohol and drug use, employment, family and social relationships, legal, medical, and psychological (McLellan, Luborsky, Woody, & O'Brien, 1980; McLellan et al., 1992; Bovasso, Alterman, Cacciola, & Cook, 2001). A 0 to 1 composite score indicates problem severity in that area, with higher scores indicate greater severity. Distinguished by excellent reliability and validity (Bovasso et al., 2001; Kosten, Rounsaville, & Kleber, 1983), the ASI is widely-used in the SUD treatment field (McLellan, Cacciola, Alterman, Rikoon, & Carise, 2006).

Conceptualized as *enabling* factors, SUD treatment modality (residential, outpatient drug free, methadone) and SUD treatment duration were determined based on California Alcohol and Drug Data System (CADDs), the state database that tracks all admissions and discharges within publicly funded/licensed SUD treatment programs. SUD treatment was considered an enabling factor because SUD providers are well-positioned to identify mental health need among their clients, and link them with mental health services. Receipt of public assistance is also conceptualized as an enabling factor, because it can serve as a resource that women can use to address conditions of poverty or other factors (lack of child care, no transportation) that would otherwise function as barriers to mental health care. Furthermore, in many parts of California, individuals who receive public assistance are directly linked to specialty mental health services if needed. Data for this variable was provided by the ASI.

2.3. Analysis

We stratified the sample by five mental health diagnostic categories. For each group, we plotted the mean number of mental health services utilized per woman per year for each year pre- and post-SUD treatment. We compared groups on characteristics, SUD treatment, and mental health service use by using chi-square statistics for categorical variables and analysis of variance for continuous variables. Next, we fitted 2–6 class latent class models (LCA) with Mplus 7.2 (Muthén & Muthén, 2006) to the outcome of having utilized a high (vs. none/low to moderate) number of services over each of 8 years. To select the number of classes, we examined several fit indices: Bayesian Information Criterion (BIC) (Schwartz, 1978), adjusted BIC (Sclove, 1987), Lo-Mendell-Rubin (LMR) likelihood ratio test (Lo, Mendell, & Rubin, 2001), adjusted LMR likelihood ratio test (Lo, Mendell, & Rubin, 2001), and bootstrapped likelihood ratio test (McLachlan, 1987; McLachlan & Peel, 2000). We also inspected the patterns of the estimated high-level service utilization probabilities over eight years and selected a model based on model fit and substantive interpretability. The four- and five-class latent class models had the lowest BIC values (17686.701 vs. 17685.429). The six-class latent class model had the lowest AIC values compared to the four- and five-class models (17530.606 vs. 17575.485 and 17545.614, respectively). LMR, ALMR and BLRT tests were significant and supported the five-class model. Comparison of the five and six-class models indicated untrustworthiness due to local maxima. Parameter estimates revealed the five-class model contained three threshold estimates equal to the upper or low boundary values (−15 or 15) with standard errors fixed as zero. Consequently, we selected the four-class model. Finally, by using the R3STEP procedure (Asparouhov & Muthén, 2014) to avoid errors in LCA membership classification, we conducted multinomial logistic regression analysis on the class membership to identify predisposing, enabling, and need factors associated with distinct 8-year patterns of mental health utilization and high-level mental health services utilization. We used a two-tailed significance level at $p < 0.05$ for all statistical tests using SAS Enterprise Guide 5.1 (SAS Institute Inc., 2013).

3. Results

3.1. Characteristics of women at SUD treatment entry by disorder type

Compared to women with only SUD, women with any type of COD were generally older (33.5 – 34.5 years vs. 32.8), more were white (61.1%–68.3% vs. 53.7%) (Table 1), more

were homeless (16.6%–21.6% vs. 13.9%), fewer were married (14.0%–18.5% vs. 20.3%), more had experienced physical (71.6%–84.1% vs. 65.6%) or sexual abuse (57.1%–68.7% vs. 44.9%), and more received public assistance (42.9%–59.3% vs. 33.5%).

Fewer women with COD reported methamphetamine as the primary substance problem (29.2%–40.3% vs. 42.7%). Substances had been used for more years by these women (13.8–15.2 years vs. 13.6) and more had experienced prior treatment for alcohol (32.8%–37.3% vs. 22.5%) and drugs (55.5%–72.1% vs. 53.7%). More women with COD received residential SUD treatment than women with only SUD (28.2%–35.2% vs. 24.9%).

ASI composite scores indicated that women with COD had more severe problems related to alcohol use (0.23–0.26 vs. 0.20), employment (0.75–0.84 vs. 0.72) medical illness (0.25–0.29 vs. 0.18), family problems (0.24–0.31 vs. 0.21) and psychiatric illness (0.29–0.46 vs. 0.20). Relative to women with only SUD, more women with COD reported mental illness symptoms (anxiety, depression), more had received psychiatric medications (23.4%–52.8% vs. 9.9%), and more expressed desire for psychiatric treatment (63.6%–87.6% vs. 51.8%). Notably, women with psychosis or bipolar disorder exhibited more severe problems in several domains than women with other types of mental health diagnoses.

3.2. Type and amount of mental health services utilized

Over eight years after entering SUD treatment, about 50% of women utilized some mental health services; the amount utilized varied by time and diagnosis type (Figure 1). Utilization was generally highest one to two years following SUD treatment and among women with psychosis or bipolar disorder (Table 2). Similarly, a high amount of services (6 services) was received by a greater proportion of women with psychosis or bipolar (58.6%, 47.2%) than by women with depressive disorders or other disorders (35.0%, 20.1%).

Among women with only SUD, 966 (or 29.7%) were diagnosed with mental illness some time after SUD treatment entry; among this group, 30.0% received a low to moderate amount mental health services, and 8.5% received a high amount (Table 2).

3.3. Distinctive high-level mental health services utilization classes

The selected model had four distinctive latent pattern classes (Figure 2). Most women (76.9%) had a low probability of utilizing a high amount of mental health services each year. For some women, however, the probability of utilizing a high amount of services decreased immediately following SUD treatment and then increased (9.3%); for others it increased and then decreased (8.7%). Relatively few women (5.1%) utilized a high amount of services consistently over time. Different proportions of women were included in each latent class by disorder type. More women with psychosis or bipolar disorders were members of the “remains high” (30.9%, 20.6% vs. 1.8%–12.4%) utilization class and fewer were members of the “remains low” class (34.0%, 45.9% vs. 56.4%–87.9%) (Figure 2).

3.4. Characteristics of women by mental health services utilization classes

There were differences in the characteristics of women at SUD treatment entry by type of mental health services utilization class (Table 3). Women in the “remains high” class were

older (35.2 years vs. 32.8–33.3), more were African American (22.7% vs. 15.6%–18.5%), and fewer were Hispanic (13.5% vs. 17.3%–23.5%). Fewer women in this class had attained a high school education (58.4% vs. 57.1%–62.8%), fewer were employed (10.8% vs. 16.3%–23.9%), more received public assistance (58.4% vs. 34.3%–62.0%), fewer were married (31.2% vs. 39.0%–40.7%), and more were homeless (22.9% vs. 14.1%–20.5%). Also, more of these women used cocaine (15.2% vs. 11.1%–13.5%), more had received SUD treatment previously, and their SUD treatment retention was longer (123.9 days vs. 96.3–102.6). Finally, this group had more severe problems in multiple domains, more reported psychiatric symptoms and receipt of psychiatric medications (59.3% vs. 12.2%–43.1%), and more wanted psychiatric treatment (86.6% vs. 53.9%–75.1%).

3.5. Factors associated with different patterns of high-level mental health services utilization

Membership in the “remains high” class (vs. “remains low”) was positively associated with psychosis (vs. SUD only) (OR 44.93, $p<0.001$), bipolar (OR 18.16, $p<0.001$), depressive (OR 8.35, $p<0.001$), and other mental health disorders (OR 2.89, $p<0.001$) (Table 4). Class membership was also positively associated with desire for mental health treatment (ORs 1.46, $p<0.001$).

In addition to evaluated and perceived need, the likelihood of utilizing a consistently high number of services (vs. “remains low”) was also increased by older age (OR 1.04, $p<0.001$) and homelessness (OR 1.68, $p<0.05$) and it was decreased by marriage (OR 0.60, $p<0.05$) and employment (OR 0.53, $p<0.05$). Public assistance increased the likelihood of membership in the “remains high” class (OR 1.76, $p<0.01$) as did outpatient drug free (vs. methadone) SUD treatment (OR 3.69, $p<0.01$) and longer SUD treatment duration (OR 1.00, $p<0.01$).

Likelihood of membership in the increasing (vs. “remains low”) group was increased by physical/sexual abuse histories (OR 1.57, $p<0.01$) and homelessness (OR 1.50, $p<0.05$), and decreased by methamphetamine (vs. other drugs) use (OR 0.72, $p<0.05$).

Likelihood of membership in the decreasing (vs. “remains low”) class was decreased by marriage (OR 0.62, $p<0.01$) and increased by physical/sexual abuse histories (OR 1.60, $p<0.01$) and receipt of public assistance (OR 1.46, $p<0.05$).

4. Discussion

Study findings showed that women with COD were more likely than women with only SUD to be older, white, homeless, unmarried, have histories of physical or sexual abuse, and receive public assistance. These women were also more likely to report methamphetamine use as their primary substance-related problem, have longer substance use histories, and have more prior experience with SUD treatment. Among women who were not diagnosed with COD prior to SUD treatment, approximately 30% later received a mental health diagnosis. Overall, approximately half of women who received SUD services utilized some mental health services within eight years of SUD treatment, though the amount utilized

varied by time and diagnosis type. Notably, only 5.1% of women in the sample were consistently high users of mental health services throughout the study period.

Findings show the heterogeneous and dynamic nature of women's longitudinal patterns of high mental health services use and indicate that different patterns of high services use are associated with not only mental health diagnosis, but a number of other factors as well. Most women had a low probability of utilizing a high amount of mental health services each year. Membership in the "remains high" group was associated with older age, lack of a high school education, unemployment, receipt of public assistance, and homelessness. Compared to the rest of the sample, a higher proportion of this group was African American, and fewer were Hispanic or married. Other women demonstrated an initially high then decreasing pattern of high use. Membership in this group (relative to membership in the "remains low group") was positively associated with a COD diagnosis but also a history of physical/sexual abuse, receipt of public assistance, and a desire for services; being married was negatively associated with membership in this group. These findings support existing research showing the relationship between high use of mental health services and challenges related to income and housing (Pasic et al., 2005; Chaput & Lebel, 2007; Morlino et al., 2011; Lindamer et al., 2012; Vandyk et al., 2013; Vandyk et al., 2014). Another group of women had an initially low then increasing probability of high use of mental health services. In addition to COD diagnosis, membership in this group was positively associated with a history of physical/sexual abuse, homelessness, and a desire for services, and it was negatively associated with methamphetamine as the primary problem drug. Several of these findings are notable. In spite of great need for mental health services, approximately half of women in SUD treatment did not utilize any mental health services for eight years after initiating treatment, and just over 5 % of them were likely to remain consistently high utilizers for eight years. Among women with COD diagnosed prior to SUD treatment, between 6.8% and 29.6% did not receive any mental health services over the subsequent eight years. These findings align with prior research that has shown that few individuals with COD receive adequate treatment for either or both disorders (Curran et al., 2011; Weaver et al., 2008; Koegel et al., 1999; Urbanoski et al., 2008; Compton, Thomas, Stinson, & Grant, 2007; Harris & Edlund, 2005; Wu, Ringwalt, & Williams, 2003; McGovern et al., 2010; Drake & Bond, 2010; McGovern et al., 2014; SAMHSA, 2014), and that women have high levels unmet need for mental health services (U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, 2013). Given the high rates of mental illness among women in SUD treatment, these findings underscore the importance of improving SUD treatment providers' capacity to identify woman clients who need mental health services, link them to treatment, and assure that they remain engaged in mental health treatment if necessary. The mental health treatment gap for women with COD indicates a need to understand and better address barriers to care (Compton et al., 2007) and highlights the need to continue ongoing efforts to integrate systems of care that identify and treat individuals with COD.

These data also show the need to better understand why these utilization patterns occur and highlight potential leverage points for intervention efforts. For example, it may be that the social support and other resources for recovery that are often provided to women by marriage and employment (SAMHSA, 2009) ameliorate the need for mental health care,

whereas reliance on public assistance and abuse histories increase the likelihood that women may need mental health services. By considering these factors when delivering services, SUD treatment providers may be able to influence the amount and timing of when women with SUD use mental health care.

Study findings have several other potential implications for clinical practice and policy. Findings concerning the characteristics of women with COD who receive SUD treatment can be used to inform the development of COD programs within SUD treatment settings. In particular, COD services can be tailored to address the socio-economic and housing challenges that are common among women with COD in SUD treatment, and incorporate evidence-based approaches to serving individuals with SUD and histories of trauma (e.g., Najavits, Weiss, Shaw, & Muenz, 1998).

The fact that approximately half of women who receive SUD treatment utilize mental health services within eight years is not surprising given the generally high rates of COD among women treated for SUD (Greenfield et al., 2007; Greenfield & Grella, 2009; SAMHSA, 2009; Tuchman, 2010). To our knowledge, however, the present study is the first to document services utilization among women with SUD by mental health diagnosis type. Women in the study who had bipolar and psychotic disorders were more likely than women with depressive or other disorders to utilize mental health services, and they were more likely to utilize these services frequently. These findings highlight the urgent need for SUD treatment providers to offer integrated COD treatment options that effectively address the needs of women with bipolar and psychotic disorders, and to equip these women with strategies to better manage their mental health conditions after discharge. Since evidence concerning the effects of psychosocial interventions on mental health outcomes for individuals with COD is limited and varied (Drake, O'Neal, & Wallach, 2008; Horsfall, Cleary, Hunt, & Walter, 2009), this is an area that warrants further research.

Findings must be considered within the context of several study limitations. Women were enrolled from public SUD treatment programs, so findings may not be representative of general populations of women with SUD. The primary dependent and independent variables relied on administrative data, which are subject to reporting biases (McCarty, McGuire, Harwood, & Field, 1998; Saunders & Heflinger, 2004) but also valuable for investigating long-term service system use (McCarty et al., 1998; Hser & Evans, 2008; Evans, Grella, & Murphy, 2010). Women were coded into diagnostic categories according to mental illness severity. This operationalization was consistent with group differences in baseline psychiatric severity as indicated by the ASI (see Table 1), but nevertheless results were likely affected by imperfect psychiatric severity measurement by SUD treatment providers. Additionally, we used 6 services/year to define high services use whereas other studies have used different criteria to define high use. A limitation of this approach is that our measure (number of services per year) does not allow for any conclusions to be drawn about the necessity or appropriateness of mental health services delivered. We considered both inpatient and outpatient care and our sample was comprised of all women treated by public programs, i.e., a group known to need and use more mental health care than other populations. The context in which study data were gathered also warrant consideration when interpreting results. The time when individuals in the study sample entered treatment (2000–

2002) coincided with a dramatic increase in methamphetamine use in California; as a result, this drug was the primary substance used by approximately 40% of women in the sample. Methamphetamine has particularly strong effects on users' psychiatric functioning (Zweben et al., 2004). Therefore, although the study did capture problematic use of cocaine, heroin, and other substances, results may nevertheless be of limited import to eras and locales in which substances other than methamphetamine are more commonplace. Also, outcomes may vary depending on the types of mental health care that are received. These issues were not examined by the present study, constituting areas for future research.

Study strengths include the longitudinal prospective design, a statistical approach that captures the dynamic nature of services utilization, a widely-used model of health services use, and focus on a relatively large and ethnically diverse sample of women, i.e., a group that has historically been underrepresented in COD research (SAMHSA, 2009; Brady et al., 2009; Mathias, 1995). From a conceptual perspective, a key strength of this paper is the focus on women, a group that has historically been underrepresented in addiction research and theory (Brady et al., 2009; Mathias, 1995; SAMHSA, 2009). The design of the present study advances exploration of the diversity of experiences among subgroups of women treated for SUD.

5. Conclusions

Many women who receive SUD treatment need or want mental health services, but do not receive them, while other women exhibit different patterns of mental health service utilization over time. High mental health services use patterns among women treated for SUD are heterogeneous and dynamic, and associated with their perceived need, predisposing characteristics, and several enabling factors. Improved understanding of the characteristics and factors associated with different patterns of mental health services utilization may aid efforts to improve access to mental health services while also ensuring that the mental health care that women with COD receive is as clinically appropriate and cost effective as possible.

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Figure 1.
Use of mental health services among women treated for substance use disorders (SUD) by type of disorder (n=4,447)

Figure 2.
Patterns of high mental health services utilization 8 years after treatment for substance use disorders (SUD)

Table 1

Characteristics of women at entry into treatment for substance use disorders (SUD)

	SUD only (n=3,258)		Other MH (n=308)		Depressive (n=486)		Bipolar (n=233)		Psychosis (n=162)	
	% or n	sd	% or n	sd	% or n	sd	% or n	sd	% or n	sd
Predisposing										
Age***	32.8	7.6	32.4	7.8	34.0	7.7	33.5	6.8	34.5	7.3
Race/ethnicity***										
White	53.7		61.1		62.7		68.3		41.0	
Hispanic	23.2		22.9		20.0		14.8		15.5	
African American	16.7		11.1		12.7		11.7		36.7	
Other	6.4		4.9		4.6		5.2		6.8	
Attained high school degree	58.3		58.4		58.0		67.4		56.2	
Employed part- or full-time	24.3		17.9		21.2		14.6		9.9	
Married***	20.3		14.0		18.1		17.2		18.5	
Homeless**	13.9		16.6		17.9		19.3		21.6	
Ever physically abused lifetime***	65.6		80.2		76.5		84.1		71.6	
Ever sexually abused lifetime***	44.9		57.1		61.3		68.7		65.4	
Pregnant currently*	9.6		11.7		6.6		7.7		4.3	
Primary drug problem type***										
Methamphetamine	42.7		40.3		37.5		39.5		29.2	
Alcohol	20.1		24.4		26.1		24.0		23.0	
Heroin	13.4		14.3		14.4		16.3		14.3	
Cocaine	11.3		10.1		9.9		10.7		24.8	
Marijuana	10.2		8.8		10.1		6.9		8.1	
Years of primary drug use***	13.6	8.0	13.8	8.1	15.2	8.5	14.8	8.0	14.6	8.0
Used drugs in past 30-days**	20.5		20.8		22.2		32.2		20.4	
Prior treatment for alcohol***	22.5		32.8		34.6		37.3		34.6	
Prior treatment for drugs***	53.7		55.5		59.7		72.1		69.1	
Need										

	SUD only (n=3,258)		Other MH (n=308)		Depressive (n=486)		Bipolar (n=233)		Psychosis (n=162)	
	% or m	sd	% or m	sd	% or m	sd	% or m	sd	% or m	sd
Predisposing										
ASI alcohol ***	0.15	0.24	0.18	0.25	0.19	0.26	0.20	0.27	0.18	0.23
ASI drug **	0.13	0.12	0.13	0.12	0.13	0.12	0.15	0.13	0.15	0.12
ASI medical ***	0.18	0.30	0.25	0.34	0.28	0.35	0.29	0.34	0.27	0.35
ASI employment ***	0.72	0.29	0.75	0.27	0.75	0.28	0.77	0.25	0.84	0.23
ASI family ***	0.21	0.24	0.24	0.24	0.25	0.24	0.31	0.26	0.28	0.25
ASI legal *	0.16	0.20	0.15	0.20	0.13	0.19	0.15	0.20	0.16	0.20
ASI psychiatric ***	0.20	0.22	0.29	0.25	0.38	0.25	0.46	0.25	0.43	0.27
Psychiatric meds in past 30-days ***	9.9		23.4		41.0		52.8		51.2	
Anxiety in past 30-days **	38.0		47.7		61.5		75.1		65.4	
Depression in past 30-days ***	33.1		43.8		54.1		65.7		56.8	
Trouble understanding, concentrating, remembering in past 30-days ***	25.9		37.7		50.0		59.2		55.6	
Hallucinations in past 30-days ***	3.4		7.1		7.8		18.9		31.5	
Thoughts of suicide in past 30-days ***	5.1		11.7		16.3		20.2		14.8	
Suicide attempt in past 30-days ***	0.9		2.6		5.8		5.6		6.2	
Wants treatment for psych problems ***	51.8		63.6		77.9		87.6		80.9	
Enabling										
Receives public assistance ***	33.5		42.9		47.3		48.5		59.3	
SUD treatment modality **										
Residential	24.9		30.2		28.2		33.1		35.2	
Outpatient drug free	68.7		63.0		67.5		60.5		58.6	
Methadone	6.4		6.8		4.3		6.4		6.1	
SUD treatment retention, days (p=0.07)	99.8	121.3	86.8	109.7	107.0	134.8	86.9	120.1	85.0	112.2

* p<0.05;

** p<0.01;

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d
<0.001. 14.5% of women had several mental health diagnoses and were coded into the category of greatest severity. Among women with psychosis, 24% also had bipolar disorder, 40% had depressive disorder, 21% had an other disorder (17% adjustment disorder, 4% anxiety). Among women with bipolar disorder, 42% had depressive disorder, 25% had an other disorder (15% adjustment disorder, 10% anxiety). Among women with depressive disorder, 21% had an other disorder (12% adjustment disorder, 9% anxiety).

Women's use of mental health services over 8 years after entry into treatment for substance use disorders (SUD)

Table 2

	SUD only (n=3,258)	Other MH (n=308)	Depressive (n=486)	Bipolar (n=233)	Psychosis (n=162)
Total # of all MH services received ^{***}	51,775	12,793	34,854	25,640	35,713
Mean # of all MH services received per woman ^{***}	15.9	41.5	71.7	110.0	220.5
Mean # of all MH services received per woman per year ^{***}	2.2	6.0	10.1	15.3	30.0
Mean # of inpatient MH services received per woman ^{***}	1.5	2.9	4.7	5.0	38.9
Mean # of inpatient MH services received per woman per year ^{***}	0.2	0.4	0.6	0.6	4.9
Amount of all MH services received per year, % ^{***}					
None (0 services)	61.5	29.6	19.6	12.5	6.8
Low to moderate (>0 to 5 services)	30.0	50.3	45.5	40.3	34.6
High (≥ 6 services)	8.5	20.1	35.0	47.2	58.6

* p<0.05;

** p<0.01;

*** p<0.001

Table 3

Characteristics of women by high mental health use class

Predisposing	Remains High		Increasing		Decreasing		Remains Low	
	% or m	sd	% or m	sd	% or m	sd	% or m	sd
Age***	35.2	6.8	33.3	7.1	33.3	8.3	32.8	7.5
Race/ethnicity***								
White	59.8		57.6		59.2		54.6	
Hispanic	13.5		19.1		17.3		23.5	
African American	22.7		18.5		17.3		15.6	
Other	3.4		4.7		6.1		6.3	
Attained high school degree	58.4		62.8		60.9		57.1	
Employed part- or full-time***	10.8		19.9		16.3		23.9	
Married***	31.2		39.0		40.7		40.3	
Homeless**	22.9		20.5		14.9		14.1	
Ever physically abused lifetime***	79.6		77.7		80.0		66.3	
Ever sexually abused lifetime***	68.4		61.3		66.9		45.5	
Pregnant currently	6.9		10.8		7.1		9.3	
Primary drug problem type**								
Methamphetamine	34.2		32.9		40.9		42.6	
Alcohol	28.1		27.6		22.6		20.2	
Heroin	12.6		15.3		13.1		13.8	

	Remains High			Increasing			Decreasing			Remains Low		
	% or m	sd		% or m	sd		% or m	sd		% or m	sd	
Predisposing												
Cocaine	15.2			13.5			11.1			11.1		
Marijuana	7.4			8.2			11.1			10.0		
Years of primary drug use ***	15.9	8.5		14.9	8.5		14.8	5.4		13.6	8.0	
Used drugs in past 30-days **	29.4			22.0			24.3			20.4		
Prior treatment for alcohol ***	40.3			35.5			30.9			23.4		
Prior treatment for drugs ***	64.9			61.9			62.0			54.3		
Need												
ASI alcohol ***	0.20	0.25		0.20	0.26		0.17	0.26		0.15	0.24	
ASI drug	0.14	0.12		0.14	0.12		0.14	0.12		0.13	0.12	
ASI medical ***	0.32	0.37		0.25	0.34		0.28	0.34		0.19	0.30	
ASI employment ***	0.81	0.24		0.75	0.27		0.76	0.27		0.73	0.29	
ASI family ***	0.28	0.26		0.27	0.26		0.26	0.24		0.21	0.24	
ASI legal	0.14	0.20		0.16	0.19		0.15	0.19		0.16	0.20	
ASI psychiatric ***	0.48	0.25		0.32	0.26		0.38	0.26		0.21	0.23	
Psychiatric meds in past 30-days ***	59.3			23.8			43.1			12.2		
Anxiety in past 30-days ***	71.4			56.9			59.7			39.7		
Depression in past 30-days ***	66.7			46.3			55.4			34.5		
Trouble understanding, concentrating, remembering in past 30-days ***	60.6			44.6			45.7			27.7		

	Remains High			Increasing			Decreasing			Remains Low		
	% or m	sd		% or m	sd		% or m	sd		% or m	sd	
Predisposing												
Hallucinations in past 30-days ***	23.4			8.8			10.3			4.1		
Thoughts of suicide in past 30-days ***	22.5			12.6			16.9			5.6		
Suicide attempt in past 30-days ***	6.1			2.6			5.1			1.3		
Wants treatment for psych problems ***	86.6			69.2			75.1			53.9		
Enabling												
Receives public assistance ***	58.4			44.3			47.7			34.3		
SUD treatment modality *												
Residential	28.1			28.4			32.6			25.5		
Outpatient drug free	68.4			65.4			62.9			68.0		
Methadone	3.5			6.2			4.6			6.5		
SUD treatment retention, days **	123.9	157.0		102.6	127.4		101.7	132.0		96.3	117.3	

* p<0.05;

** p<0.01;

*** p<0.001.

Table 4
Multinomial regression predicting class membership of 8-year mental health services utilization

	Decreasing vs. Low	Increasing vs. Low	High vs. Low
	Odds ratio	Odds ratio	Odds ratio
Predisposing			
Age, years	1.00	1.00	1.04**
African American (vs. white)	1.21	1.04	1.30
Hispanic (vs. white)	0.81	0.88	0.62
Other (vs. white)	0.98	0.78	0.62
Attained high school degree (vs. no)	1.09	1.17	0.86
Married (vs. not married)	0.62**	0.78	0.60*
Employed (vs. not employed)	0.75	0.85	0.53*
Methamphetamine (vs. other drugs)	1.05	0.72*	0.92
Physically/sexually abused	1.60**	1.57**	1.58
Homeless	0.77	1.50*	1.68*
Had prior alcohol or drug treatment	1.11	1.30	1.10
Need			
Psychosis vs. SUD	13.36***	6.89***	44.93***
Bipolar vs. SUD	8.47***	3.42***	18.16***
Depressive vs. SUD	6.04***	3.03***	8.35***
Other disorders vs. SUD	3.02***	2.19***	2.89***
ASI alcohol score	0.86	1.58	0.97
ASI drug score	0.74	0.74	0.64
Wants treatment for psych problems	1.22***	1.12**	1.46***
Enabling			
Receives public assistance	1.46*	1.25	1.76**
Outpatient (vs. MMT)	1.70	1.22	3.69**

	Decreasing vs. Low	Increasing vs. Low	High vs. Low
	Odds ratio	Odds ratio	Odds ratio
Residential (vs. MMT)	2.33	1.08	2.85
Treatment retention, days	1.00	1.00	1.00***

* p<0.05;
** p<0.01;
*** p<0.001