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Classifying substance use disorder treatment facilities with co-located mental health services: A latent class analysis approach

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Abstract

Background—The Affordable Care Act calls for increased integration and coordination of behavioral health services, as people with co-occurring disorders (CODs), meeting criteria for both substance use and psychiatric disorders, are overrepresented in treatment samples. Nationwide estimates of mental health (MH) service co-location in substance use disorder (SUD) treatment facilities are needed. We empirically derived a multiple-indicator categorization of services for CODs in SUD treatment facilities.

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Conflict of Interest

Drs. Mauro, Crum, and Furr-Holden have no conflict of interest to report.

Contributors

Dr. Mauro designed the study, conducted analyses, and drafted the full manuscript. Dr. Mojtabai advised Dr. Mauro throughout the development and execution of the study, as well as provided substantive and editorial feedback. Drs. Furr-Holden, Strain, Crum, and Mojtabai provided feedback in the interpretation of results, discussion of the implications of findings, and provided editorial feedback for the manuscript. All authors have contributed to the manuscript and approved the final version of the manuscript.

Methods—We used latent class analysis to categorize 14,037 SUD treatment facilities in the United States and territories included in the 2012 National Survey of Substance Abuse Treatment Services. Latent class indicators included MH screening and diagnosis, MH support services, psychiatric medications, groups for CODs, and psychosocial approaches. Multinomial logistic regression compared facility-identified primary focus (i.e., SUD, MH, mix of SUD-MH, and general/other) and other facility characteristics across classes.

Results—A four-class solution was chosen with the following classes: Comprehensive MH/COD Services (25%), MH without COD Services (25%), MH Screening Services (21%), and Limited MH Services (29%). The former two classes with co-located MH services were less likely to report a SUD-primary focus than the latter classes reporting only MH screening or Limited MH Services. Only the Comprehensive MH/COD Services class also had a high probability of providing special groups for CODs.

Conclusions—Approximately half of SUD treatment facilities were in classes with co-located mental health services, but only a quarter provided comprehensive COD services. Future studies should assess differences in patient experiences and treatment outcomes across facilities with and without COD services.

Keywords

substance use disorder; treatment; co-occurring disorders; mental health

1. INTRODUCTION

Substance use disorders (SUDs) often occur with other psychiatric disorders; when presenting together, these are considered co-occurring disorders (CODs). In the 2014 United States (US) National Survey of Drug Use and Health (NSDUH), 41% of individuals with a SUD had a COD in the past year, representing 3.3% of the US population (Han et al., 2015). When untreated, CODs are associated with worse symptoms and treatment outcomes than SUDs without a COD (Center for Substance Abuse Treatment (CSAT; 2005). As CODs are common in treatment samples (Minkoff and Cline, 2004), mental health (MH) screening is a recommended standard practice in SUD treatment (Kleber et al., 2006) to ensure targeted use of resources (Flynn and Brown, 2008). In order to meet the basic needs of people with CODs, treatment facilities can have a plan to connect individuals with CODs to services if indicated following MH screening (CSAT, 2005). However, relying on referrals places the burden of receiving appropriate treatment on the individual and is inconsistent with “patient-centered care” (Burnam and Watkins, 2006; Institute of Medicine, 2006). Indeed, many referrals to treatment do not actually translate to receipt of treatment, or timely receipt of treatment (Ducharme et al., 2006).

One way to reduce reliance on referrals and increase the likelihood of addressing CODs in a treatment setting is through integrated or co-located services (Kleber et al., 2006; Ziedonis, 2004), which has been inconsistently defined in the literature (Heath et al., 2013). The American Society of Addiction Medicine (ASAM) differentiated SUD treatment providers with *addiction only services* that do not provide any MH treatment services, *dual diagnosis capable programs* that included MH assessment and policies that directly incorporate CODs

in their planning, and *dual diagnosis enhanced programs* that provide integrated treatment for CODs (ASAM, 2001). An updated framework distinguishes practices based on location and provision of coordinated, co-located, and integrated care (Heath et al., 2013). Coordinated care practices provide no or limited collaboration at a distance. Co-located care practices provide both services in the same facility with varying levels of collaboration. Integrated care practices provide services as part of a team with high levels of collaboration, evolving into a fully merged practice with a single integrated treatment plan (Heath et al., 2013). As service co-location is an important step towards service integration, further understanding of the availability of co-located MH services in SUD treatment settings is needed.

Estimates of the degree to which SUD facilities co-locate and integrate treatment for CODs range widely based on the methodology and data source utilized (Bond and McGovern, 2013; Ducharme et al., 2006, 2007; Gil-Rivas and Grella, 2005; Gotham et al., 2010; Guerrero et al., 2014; Knudsen et al., 2004; Lambert-Harris et al., 2013; McGovern et al., 2006, 2007, 2014; Timko et al., 2005). Data collected from program providers typically utilize a single item to assess the capability to treat CODs. These estimates indicate that about half (50–58%) of providers are capable of treating CODs, measured as having special groups for people with CODs (Mojtabai and Olfson, 2004), offering integrated care (Ducharme et al., 2006), or providing a psychiatric program (Knudsen et al., 2004). Facility identified primary focus, particularly indicating a mixed SUD and MH primary focus, has also been used as a proxy measure for integration (Guerrero and Kao, 2013). Advantages of single-indicator methods include ease of measurement and availability of nationwide estimates using facility data. However, single-indicator methods can introduce measurement error, often do not capture the heterogeneity of services provided, or are used inconsistently across studies.

Multiple-indicator methods can be used to address limitations of single-item estimates. One such approach is the Dual Diagnosis Capability in Addiction Treatment (DDCAT), which utilizes multiple indicators collected via site visits, interviews and document reviews by independent raters (McGovern et al., 2007). The DDCAT ratings correspond with ASAM (2001) criteria. In one study, only 18% of a sample of US-based SUD treatment providers were *dual diagnosis capable* using the DDCAT (McGovern et al., 2014). The comprehensive DDCAT data collection requires using external raters, which can be resource-intensive and cost-prohibitive, therefore limiting the sample sizes of studies (McGovern et al., 2014; Sacks et al., 2013). Despite its increased uptake across the US (e.g., Sacks et al., 2013) and internationally, DDCAT data are not available for facilities nationwide.

Using existing data to ascertain the degree of COD service co-location could be helpful to better understand current practices and future service needs. Empirical studies are needed to compare single and multiple indicator classification models to differentiate facilities with and without MH service co-location, without relying on external raters. In addition, a classification model utilizing multiple indicators could provide a more comprehensive measure of COD services at a national level. Practitioners could use such a classification when matching patients based on clinical need to complement existing treatment facility descriptions.

The National Survey of Substance Abuse Treatment Services (N-SSATS) provides a unique opportunity to assess the co-location of services in all known SUD treatment facilities in the US and territories (Substance Abuse and Mental Health Services Administration; SAMHSA, 2013). Before 2006, the N-SSATS included very limited data on MH services (Ducharme et al., 2006). The 2006–2007 N-SSATS introduced measures of MH screening, MH support services, psychiatric medications, and clinical or therapeutic approaches utilized in SUD treatment (SAMHSA, 2012). Facilities in the N-SSATS can also self-identify their primary focus (SAMHSA, 2013). These measures allow for studies to categorize facilities utilizing multiple MH service indicators, while also accounting for facility-level factors that may facilitate or hinder service co-location (Burnam and Watkins, 2006; Croft and Parish, 2013; Gotham et al., 2010; McFarland and Gabriel, 2004; Mojtabai, 2004).

This study aimed to: (a) use latent class analysis (LCA) to develop a measurement model with data from the 2012 N-SSATS that explicitly incorporated MH service indicators; and (b) compare this multiple-indicator classification to a single-indicator approach using primary focus of the facility. The model can contribute to an empirically based approach to assessing the capability of SUD services to care for patients with CODs. In particular, this study aimed to improve on single-indicator measures by using multiple indicators accounting for latent variable measurement error, and to use secondary data to provide nationwide estimates of co-location.

2. MATERIAL AND METHODS

2.1 Data source

The N-SSATS is a voluntary survey of all known public and private SUD treatment facilities operating in the US and its territories, and is sponsored by the SAMHSA Center for Behavioral Health Statistics and Quality and collected by Mathematica Policy Research. Facilities are identified through the SAMHSA Treatment Facility Locator, states, or survey staff (SAMHSA, 2013). Facilities are defined by their physical location, point of service delivery, or state license. Facilities exclusively operating within correctional settings, halfway houses not providing SUD treatment, and independent individual providers are excluded (SAMHSA, 2013).

2.2 Data collection

The 2012 N-SSATS survey captured facility characteristics and services provided. Invitations to participate via mail or online were sent before the March 31, 2012, reference date. Facility administrators failing to respond after four months were asked to complete a computer-assisted telephone interview (SAMHSA, 2013). In 2012, there were 16,114 active SUD treatment or detoxification facilities in the US and territories. A total of 93% of the facilities eligible to participate completed the 2012 N-SSATS, and 89% were included in the public dataset. After excluding 185 facilities that reported not providing SUD treatment services, the final sample included 14,037 facilities located in the 50 states and District of Columbia (n=13,873) and US territories (n=164).

2.3 Measures

The N-SSATS reported services that were offered on-site (i.e., co-located or integrated) at the SUD treatment facility. These included MH assessment, supportive services, medications, COD groups, and psychosocial interventions provided in the SUD treatment facility.

2.3.1 Mental health assessment—Facilities reported various assessment and pre-treatment services, including “screening for mental health disorders,” and “comprehensive mental health assessment or diagnosis (e.g., psychological or psychiatric evaluation and testing)”. We created a categorical variable coded 0 if the facility did not screen or comprehensively assess MH disorders, 1 if the facility only conducted mental health screenings, and 2 if the facility conducted comprehensive mental health assessments.

2.3.2 Mental health support services—Facilities reported various ancillary (i.e., support) services, including whether the facility provided “mental health services”. No explicit operationalization of MH support services was provided. This indicator was coded 1 if the facility reported providing any support MH services, 0 otherwise.

2.3.3 Psychiatric medications—Facilities indicated whether or not they offered various pharmacotherapies, including “medications for psychiatric disorders” as part of their available pharmacotherapies. This indicator was coded 1 if the facility reported providing psychiatric medications, 0 otherwise.

2.3.4 Groups for COD—Facilities indicated whether or not they offered a “specially designed substance abuse treatment program or group” tailored for “patients with co-occurring mental and substance abuse disorders.” This indicator was coded 1 if the facility reported providing special groups for COD, 0 otherwise.

2.3.5 Psychosocial approaches—Facilities reported the frequency with which they implemented various clinical and therapeutic approaches, including cognitive-behavioral therapy (CBT), motivational interviewing (MI), trauma-related counseling, contingency management, and 12-step facilitation. Each approach was rated on a five-point Likert scale: always/often, sometimes, rarely, never, or not familiar with this approach. N-SSATS did not identify whether the intervention was used to address SUD, MH, or COD. We created a summary variable indicating the number of psychosocial approaches used always/often instead of a count of any use of the approaches to reduce the right skewness of the summary variable’s distribution.

2.3.6 Primary focus of the facility—Facilities reported their primary focus including, “substance abuse treatment services”, “mental health services”, “mix of mental health and substance abuse treatment services (neither is primary)”, “general health care”, or “other”. Due to the low frequency of general health care and other, these were combined into a “general health/other” category.

2.3.7 Other facility characteristics—Facility features that were available in N-SSATS, and that were relevant to characterizing operations that might vary in substantial ways

between facilities, were also assessed. These included facilities reporting whether they provided any medications for SUD treatment (i.e., naltrexone, disulfiram, buprenorphine, acamprosate) as part of their pharmacotherapy, and whether they provided “self-help groups (for example, AA, NA, SMART Recovery)” as part of their support services. Facilities reported whether they were privately owned non-profit or for profit, or public institutions such as the Veterans Affairs, whether payment assistance was available, as well as the state and urban location. Facilities also reported the total number of admissions and the percentage of SUD treatment patients enrolled on March 30, 2012, in that facility with “a diagnosed co-occurring mental and substance abuse disorder,” and whether some or all of their patients participated in a certified Opioid Treatment Program (OTP).

2.4 Statistical Analyses

LCA (Lazarsfeld and Henry, 1968) was used to empirically derive classes of SUD treatment facilities using observed patterns of responses. Four categorical MH and COD indicators were included in the model, as well as a count of psychosocial interventions frequently provided in the SUD treatment facility. The measures were selected from the N-SSATS to capture MH assessment and treatment as well as psychosocial SUD interventions. Full information maximum likelihood estimation was used to account for missing data; robust standard errors were computed through a sandwich estimator. Multiple random starting values were used to ensure that the parameters reflected the global, not local, maxima (McLachlan and Peel, 2000).

LCA models with one to six classes were compared using model fit statistics including Akaike Information Criterion (Akaike, 1987), Bayesian Information Criterion (BIC) (Schwartz, 1978), and sample-size adjusted BIC (Sclove, 1987). BIC is considered one of the most consistent indicators of model fit (Hagenaars and McCutcheon, 2002; Magidson and Vermunt, 2004; Nylund et al., 2007), with lower BIC indicating better fit. Models may also be selected by optimizing the relative reduction in information criteria in a scree-like plot, identifying where values level off to see the relative model fit improvement resulting from introducing additional classes (Masyn, 2013). Other fit indices included the Lo-Mendel-Rubin likelihood ratio test (Lo et al., 2001), which does not make distributional assumptions, and the Bootstrapped Likelihood Ratio Test, which compares the fitted model to a comparable model with one less class (Nylund et al., 2007). LCA models were compared based on model fit, parsimony, and interpretability.

After selecting the final model, we fit a one-step multinomial logistic regression model (Bandein-Roche et al., 1997) to estimate whether facility-identified primary focus, particularly a mixed primary focus of SUD-MH, predicted class membership. We controlled for factors that could potentially be barriers or facilitators of co-location, including facility ownership and payment assistance, as well as other service and client variables, including providing self-help or SUD medications, facilities with more than half of their patients reporting CODs, as well as whether some or all patients were part of a certified OTP. The multinomial regression controlled for total number of admissions, state, and urban location, and was conducted using Mplus version 7.11 (Muthen and Muthen, 1998–2012).

3. RESULTS

Descriptive characteristics for the 14,037 SUD treatment facilities included in this study are provided in Table 1. A quarter (24%) of facilities reported screening for MH disorders, and 29% reported not assessing or screening for MH disorders. While 62% of facilities reported providing MH support services, this indicator alone provided little information regarding the types of services offered by the facility. Over a third (38%) reported providing medications for psychiatric disorders and 37% reported having special groups for people with CODs. On average, facilities reported administering 2.4 psychosocial interventions always or often, and reported that 45% of their patients had CODs (interquartile range 16–72%).

Table 2 summarizes the LCA fit statistics. Although models with more classes had improved fit statistics, adding more classes typically resulted in smaller classes that were very similar to each other, but with slightly different conditional probabilities of item responses. The four class solution provided the best balance of model fit improvement, parsimony, and substantive interpretability. The latent class indicators were uncorrelated within each of the classes, meeting the LCA assumption of local independence.

Figure 1 depicts the conditional probabilities of endorsing the categorical indicators. Classes were labeled according to their patterns of conditional item response probabilities. The “Limited MH Services” class (29%) was the largest class, and had a low probability of endorsing all MH indicators, and the smallest number of psychosocial interventions frequently utilized (Table 3). The “MH Screening Services” class (21%) had a high probability of only screening for MH disorders and providing MH support services, and had the second highest average number of psychosocial interventions frequently utilized, but a low probability of providing medications or COD groups. The “MH without COD Services” class (25%) had a high probability of conducting comprehensive MH assessments, providing MH support services, and a moderate probability of providing psychiatric medications; however, it had a low probability of providing COD groups. Finally, the “Comprehensive MH/COD Services” class (25%) had a high probability of conducting comprehensive MH assessments and providing all MH and COD services, and reported the highest average number of psychosocial interventions.

Table 4 provides the estimates for the multinomial logistic regression, which regressed class membership on facility-identified primary focus (i.e., SUD primary [reference], SUD-MH mix, MH primary, or general/other) and other covariates. We report two reference classes to make pairwise comparisons easier. Primary focus was statistically significantly associated with all classes. The Limited MH Services class had the highest odds of reporting a SUD-primary focus. The Comprehensive MH/COD Services class had the highest odds of reporting a mixed SUD-MH focus, reporting more than 50% of clients with COD, providing self-help groups on-site and providing SUD medications. The Comprehensive MH/COD Services and MH without COD Services classes did not differ in the odds of reporting a MH-primary or general/other primary focus, ownership, or clients on OTP. The Limited MH Services class had the highest odds of reporting private for-profit ownership and having only OTP patients.

4. DISCUSSION

This study empirically derived classes of SUD treatment facilities based on the types of MH and COD services they reported providing. A four-class solution differentiated classes based on MH screening, diagnostic and support services, psychiatric medications, special COD groups, and frequently utilized psychosocial interventions. These included a Comprehensive MH/COD Services class (25% of facilities), a MH without COD Services class (25%), a MH Screening class (21%), and a Limited MH Services class (29%), which was the largest of the four classes and offered little to no MH services.

Facility-identified primary focus did not fully differentiate between the two classes with co-located MH services, though facilities in classes with only MH screening or Limited MH Services were the most likely to report a SUD-primary focus. This finding suggests that a single item identifying the primary focus of a facility could be used to identify facilities with a *low* probability of co-locating MH services, but is not a good indicator of integrated services. Using multiple service indicators to distinguish facilities instead of a focus indicator may provide a more objective measure of the types of services being delivered in practice. Nonetheless, environmental or cultural indicators of the facility could be used to further distinguish between co-located and integrated practices.

This study improves upon a categorization of SUD treatment facilities based on the patterns of evidence-based practices provided (Edmond et al., 2015) by explicitly incorporating MH and COD indicators and other facility-level characteristics in the measurement model. The motivational/limited class in the Edmond and colleagues' (2015) study, which comprised 50% of the treatment centers, did not distinguish between facilities with Limited MH Services and MH Screening Services. We were able to distinguish facilities that provided MH screening and some MH supportive services from the 29% of facilities with little to no MH psychosocial interventions utilized. The Limited MH Services facilities that we identified also had the lowest odds of other SUD services, such as self-help groups and SUD medications, but had the highest odds of being private for-profit and having all patients in an OTP. As integrating psychiatric services in methadone treatment may improve MH outcomes (Brooner et al., 2013), additional efforts may be needed to address the MH needs of people with opioid use disorders in methadone treatment.

One commonality across the present study and others (Edmond et al., 2015; McGovern et al., 2014) is the presence of a class with comprehensive services, which ranged from 18% to 30% of facilities in previous studies. The patterns of services in the Comprehensive MH/COD Services class seemed compatible with the *dual diagnosis capable* categorization in DDCAT. McGovern and colleagues (2014) categorized 18% of facilities as *dual diagnosis capable* using the DDCAT in a study of 180 SUD treatment programs in 11 US states. Some of the discrepancy with the present analyses may be due to over-reporting of services in administrator self-reports, compared to assessments made by independent evaluators (Lee and Cameron, 2009; McGovern et al., 2007). Estimates derived from the N-SSATS should be compared to those derived from the DDCAT in order to systematically quantify measurement error introduced by self-report in the US.

Nonetheless, our findings based on the largest sample of known SUD treatment facilities in the US indicate that a substantial proportion of facilities do not meet the basic level of capacity to begin to address CODs. Clearly, not every facility must provide fully integrated or co-located services, as patients may have different clinical needs and preferences. However, while 90% of facilities reported having clients with a COD in 2012, 29% of facilities reported providing no screening for MH disorders. This raises concerns regarding the estimated percentage of patients with CODs in Limited MH Services facilities. Additional information regarding the source of COD prevalence estimates is needed, such as whether they were derived from patient self-report or facility assessment.

The study findings should be interpreted in light of certain limitations. First, N-SSATS provides measures of availability of services, not use of services. Availability of MH services does not mean that all patients in need of those services receive them. In using a count of psychosocial interventions frequently used, equal weight was given to each intervention reported, though individual patients may disproportionately benefit from a specific intervention according to clinical needs. As this study did not assess patient outcomes, future studies should assess whether the identified categories meaningfully contribute to differences in treatment experiences and patient outcomes. Second, the classes were derived using existing measures in the N-SSATS that were not collected with the explicit intention of categorizing facilities by MH service co-location. While MH care coordination at a distance was not captured, facilities providing only SUD services may closely coordinate care and MH services with outside partners. It is also not possible to differentiate service co-location from service integration using the current N-SSATS data, unlike studies using the DDCAT (McGovern et al., 2014). We described classes in terms of “co-location” instead of “integration” to avoid assuming that services were indeed integrated into a single treatment plan, as by definition, integrated services are also co-located. N-SSATS should incorporate indicators of care coordination for MH, whether psychosocial interventions and other services are tailored for people with CODs, as well as staffing information, in order to distinguish between coordination, co-location, and integration without adding undue burden of additional interviews or focus groups. The 2015 N-SSATS included a series of questions regarding the use of electronic health records (SAMHSA, 2015), which may aid in the integration of services (Fields et al., 2015), and which may help in the measurement of co-location and integration. Third, limitations associated with latent variable approaches should be considered; as the model selection aimed to balance model fit and interpretability, model miss-specification could result in misclassification. Adding covariates to the measurement model that have been associated with service co-location, such as ownership, could potentially reduce misclassification. Finally, N-SSATS is a voluntary survey; new facilities not tied to State authorities and with non-traditional funding streams may be missed. There is no national definition of point of service delivery, leading to potential state-by-state differences in the definition of facilities.

Despite these limitations, this study extends the literature on availability of MH services in SUD treatment by incorporating treatment facilities across the US and territories, categorized by facility-reported MH and COD services. Based on the high prevalence of CODs and overall high lifetime comorbidity of SUD with other MH problems, this proposed categorization could be used by patients to assess whether the SUD treatment provider meets

their full range of behavioral health needs. It is also potentially useful to health professionals, including primary care physicians and social workers, involved in selecting the appropriate treatment facility for their patients. In using latent variable methodology, we categorized widely heterogeneous SUD treatment facilities into four classes that are easily interpretable. The use of multiple indicators to characterize SUD treatment facilities provides a more nuanced classification than single-indicator approaches.

Policies such as the Mental Health Parity and Addictions Equity Act and the Affordable Care Act (ACA) highlight the need to incorporate behavioral health services in healthcare, and provide financial incentives for SUD programs to include MH services (and vice versa). The ongoing implementation of the ACA and its emphasis on patient-centeredness could be associated with changes in service delivery by reducing fragmented financing and service delivery (Barry and Huskamp, 2011). Future studies should explore the role of the ACA on co-location and integration of services in SUD treatment, and examine modifiable barriers of co-location.

Facilitating the availability and delivery of integrated services holds the promise of improving outcomes in both SUD and MH domains for patients, and improving quality of life for a population that traditionally has had limited and fragmented access to service. In order to do so, categorization of SUD treatment facilities should explicitly capture co-located MH services, instead of listing these services as one of many other support or wraparound offerings. Additional improvements are needed to reach a gold standard for determining organizational capability to provide appropriate services for CODs (Bond and McGovern, 2013). Given the high prevalence of CODs among people with SUD, ensuring that SUD treatment providers have minimum basic competencies to screen and refer to appropriate MH services should be a clinical and public health priority.

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Highlights

- We empirically derived classes of substance use disorder (SUD) treatment facilities
- Four classes of facilities emerged using types of services offered
- Classes differed by screening services and groups for co-occurring disorders
- About half of facilities were in classes with co-located mental health services
- Primary focus of the SUD facility alone did not distinguish between classes

Figure 1.

Conditional probabilities of COD relevant services in the four classes of facilities identified in the 2012 National Survey of Substance Abuse Treatment Services.

Note: Class 1= "Limited MH services"; Class 2= "MH screening services"; Class 3= "MH without COD services"; Class 4= "Comprehensive MH/COD services"; MH= mental health; COD= co-occurring disorders

Table 1

Characteristics of substance use disorder treatment facilities in 2012 National Survey of Substance Abuse Treatment Services.

	n or <i>M</i>	% or <i>SD</i>
Assessment and Diagnosis		
MH screening only	3356	23.9
MH comprehensive assessment	6576	46.9
MH and COD services		
MH support services	8743	62.3
COD groups	5242	37.3
Psychiatric medications	5302	37.8
Psychosocial approaches		
Mean SD (Range 0–5)	2.4	0.01
Cognitive behavioral therapy	9931	70.8
Motivational interviewing	8886	63.3
Twelve step facilitation	2067	50.4
Trauma-informed therapy	4013	28.6
Contingency management	3799	27.1
Primary focus		
SUD primary	7820	55.7
SUD-MH mix	4687	33.4
MH primary	967	6.9
General/other	563	4.0
Ownership		
Private non-profit	7892	56.2
Private for-profit	4366	31.1
Public	1779	12.7
Other SUD services		
Self-help	6515	46.4
SUD medications	4437	31.6
Payment assistance	6966	49.6
Patients		
Any patients with COD	12361	88.1
Average % patients with COD (Range 0–100)	44.6	31.8
COD patients >50%	6291	44.8
Some OTP patients	305	2.2
Only OTP patients	841	6.0

MH=mental health; COD=co-occurring disorders; n=number of facilities; M=mean; SD=standard deviation

Table 2

Latent class fit statistics for identifying classes of facilities in 2012 National Survey of Substance Abuse Treatment Services

Fit statistic	2 Classes	3 Classes	4 Classes	5 Classes	6 Classes
LL	-60156	-59768	-59600	-59458	-59310
AIC	120339	119578	119255	118986	118704
BIC	120445	119736	119467	119250	119021
aBIC	120401	119669	119378	119139	118888
Entropy	0.833	0.680	0.632	0.666	0.636
VLMR LRT <i>p</i>	<0.001	<0.001	<0.001	<0.001	<0.001
BLRT <i>p</i>	<0.001	<0.001	<0.001	<0.001	<0.001
Parameters	14	21	28	35	42
Class Size					
C1	58.6%	37.9%	29.6%	27.9%	21.5%
C2	41.4%	31.9%	20.9%	23.7%	18.7%
C3	-	30.2%	24.7%	22.0%	16.4%
C4	-	-	24.7%	13.3%	15.0%
C5	-	-	-	13.1%	14.8%
C6	-	-	-	-	13.5%

LL = Log Likelihood; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; aBIC = sample-size adjusted BIC; LMR *p* = Vuong-Lo-Mendel-Ruben Likelihood Ratio Test statistic *p*-value; BLRT *p* = Bootstrapped Likelihood Ratio Test statistic *p*-value; Parameters = number of free parameters; C = class

Table 3

Latent class characteristics for the four-class solution for facilities in 2012 National Survey of Substance Abuse Treatment Services

	Class 1 Limited MH services n=4156 (29.6%)	Class 2 MH screening services n=2939 (20.9%)	Class 3 MH without COD services n=3470 (24.7%)	Class 4 Comprehensive MH/COD services n=3472 (24.7%)
MH Assessment and Diagnosis				
Screening only	0.190	0.717	0.069	0.065
Comprehensive assessment or diagnosis	0.028	0.078	0.904	0.893
MH and COD services				
Support MH services	0.025	0.634	0.967	0.987
COD groups	0.153	0.381	0.209	0.840
Psychiatric medications	0.040	0.159	0.602	0.747
Psychosocial approaches				
Mean ± SD	1.939±0.031	2.612±0.057	2.132±0.083	3.042±0.071

Class counts and proportions are based on the estimated model.

MH = mental health; COD = co-occurring disorders; SD = standard deviation

Multinomial logistic regression estimates for the four-class solution for facilities in 2012 National Survey of Substance Abuse Treatment Services

Table 4

Facility Focus	MH Screening vs. Limited MH services		MH without COD vs. Limited MH services		Comprehensive MH/COD vs. Limited MH services		Limited MH vs. Comprehensive MH/COD services		MH screening vs. Comprehensive MH/COD services		MH without COD vs. Comprehensive MH/COD services	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Facility Focus												
SUD primary	Ref		Ref		Ref		Ref		Ref		Ref	
SUD-MH mix	9.93 (7.91, 12.47)	**	48.33 (38.57, 60.55)	**	57.28 (45.37, 72.33)	**	0.02 (0.01, 0.02)	**	0.17 (0.15, 0.20)	**	0.84 (0.72, 0.98)	*
MH primary	14.88 (7.05, 31.40)	**	131.50 (65.32, 264.73)	**	129.67 (63.78, 263.62)	**	0.01 (0.00, 0.02)	**	0.11 (0.08, 0.16)	**	1.01 (0.80, 1.28)	
General/other	1.34 (0.95, 1.88)		3.79 (2.80, 5.13)	**	3.46 (2.53, 4.72)	**	0.29 (0.21, 0.39)	**	0.39 (0.27, 0.55)	**	1.10 (0.79, 1.51)	
Ownership												
Private non-profit	Ref		Ref		Ref		Ref		Ref		Ref	
Private for-profit	0.85 (0.74, 0.99)	*	0.64 (0.54, 0.75)	**	0.66 (0.56, 0.78)	**	1.51 (1.28, 1.79)	**	1.30 (1.10, 1.53)	*	0.97 (0.82, 1.13)	
Public	1.13 (0.90, 1.42)		1.38 (1.11, 1.73)	*	1.43 (1.15, 1.79)	*	0.70 (0.56, 0.87)	**	0.79 (0.64, 0.98)	*	0.97 (0.80, 1.16)	
Other SUD services												
Self-help	1.38 (1.20, 1.58)	**	1.06 (0.92, 1.23)		1.72 (1.48, 1.99)	**	0.58 (0.50, 0.67)	**	0.80 (0.69, 0.93)	**	0.62 (0.54, 0.71)	**
SUD medications	1.50 (1.26, 1.79)	**	5.25 (4.48, 6.16)	**	7.06 (6.00, 8.31)	**	0.14 (0.12, 0.17)	**	0.21 (0.18, 0.25)	**	0.74 (0.65, 0.85)	**
Payment assistance	1.29 (1.13, 1.48)	**	1.23 (1.07, 1.43)	*	1.49 (1.28, 1.74)	**	0.67 (0.58, 0.78)	**	0.86 (0.75, 1.00)		0.83 (0.72, 0.95)	*
Patients												
COD >50%	1.71 (1.48, 1.96)	**	2.15 (1.87, 2.48)	**	3.19 (2.75, 3.69)	**	0.31 (0.27, 0.36)	**	0.54 (0.46, 0.62)	**	0.68 (0.59, 0.78)	**
Some OTP	0.85 (0.53, 1.37)		0.79 (0.50, 1.24)		0.96 (0.63, 1.46)		1.04 (0.69, 1.59)		0.89 (0.56, 1.43)		0.82 (0.53, 1.28)	
Only OTP	0.73 (0.58, 0.93)	*	0.47 (0.34, 0.64)	**	0.38 (0.27, 0.53)	**	2.64 (1.89, 3.70)	**	1.93 (1.35, 2.78)	**	1.24 (0.81, 1.88)	

Estimates controlled for total admissions, state, and urban location. OR=odds ratio; CI=confidence interval; Ref=reference category; SUD=substance use disorder; MH=mental health; COD=co-occurring disorders; OTP=certified opioid treatment program

* $p < 0.05$

** $p < 0.001$