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The Imperative for Expanding the Asam Continuum of Care: Exploring Predictive Factors of Long-Term Residential Substance Use Disorder Treatment Outcomes

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Abstract

Introduction: Despite the rise in opioid and amphetamine morbidity and mortality, only about 1% of persons with substance use disorders (SUDs) pursue specialty treatment. Furthermore, the SUD treatment dropout and attrition rates remain high with less than 42% of clients completing treatment across settings. However, limited research has focused on predictive factors of treatment completion for long-term residential (LTR) SUD treatment, especially among clients with co-occurring psychiatric conditions (CODs).

Methods: A de-identified dataset was obtained from an abstinence-based LTR SUD treatment facility in an urban county. The dataset included a sample of 200 clients admitted between August 1, 2017, and March 1, 2018. The dataset included information provided by the clients during their ASAM Multidimensional Assessment and treatment disposition from their Discharge/Transfer Form. The sole dependent variable of interest in this study was the clientsâ€™ treatment disposition.

Results: Significant predictor variables of LTR SUD treatment noncompletion at $p < .05$ were past 30 days of use of primary substance used reported at intake (OR = 1.069, $p < .001$), mental health treatment and symptoms ($p < .01$), number of inpatient psychiatric episodes (OR = 1.375, $p < .019$), and readiness for change ($p < .03$). There were no significant predictors for participants who completed residential SUD treatment and transferred to a lower level of SUD care. However, past 30 days of use of primary substance used reported at intake, number of inpatient psychiatric episodes, and mental health treatment and symptoms predicted treatment outcomes for participants who left treatment and those who received an administrative discharge compared to those participants who completed residential SUD treatment and did not pursue aftercare services.

Conclusions: Clients reporting high levels of pretreatment substance use, including MA, at time of assessment should be referred to withdrawal management to decrease the likelihood of treatment noncompletion. Continuity of care for clients discharging from inpatient psychiatric hospitalization episodes is critical to improve their likelihood of completing LTR SUD treatment. Additional states need to expand their ASAM Continuum of Care and apply for 1115 Section Waivers to enhance the quality of care and treatment outcomes for clients with CODs.

Keywords: Substance use disorder; Treatment completion; Treatment attrition; Co-occurring disorders; Treatment noncompletion; Long-term residential treatment

Introduction

While approximately 40 million people aged 12 and older meet the diagnostic criteria for a substance use disorder (SUD), only about 2.7 million people received substance use treatment from a specialty facility [1]. According to recent data from SAMHSA [1], only about one quarter of the 16,000 SUD treatment facilities nationwide provide residential (non-hospital) SUD treatment, which accounts for about 16% of all admissions to SUD treatment annually. While the most common type of residential SUD treatment service provided was long-term residential (LTR) (more than 30 days), the completion rate of LTR SUD treatment is only 40.7%, lower than 42.5% completion rate among discharges for all types of SUD treatment services in 2020 [2]. Given the severe social, economic, physiological, and psychological consequences of SUDs as well as the ever-rising mortality rate associated with the proliferation of prescription opioid abuse as well as synthetic opioids, heroin, and amphetamine use [3], the factors associated with LTR SUD treatment outcomes warrant further examination.

Previous research has extensively studied predisposing demographic characteristics predictive of treatment completion across treatment settings. Clients who reported older age or identified as Non-Latine White/Caucasian were more likely to complete SUD treatment compared to their younger or non-Caucasian counterparts, respectively [4-18]. The predictive role of gender in SUD treatment completion has produced differing results [7, 11, 19, 20]. Similarly, there have been mixed evidence regarding the role of being unhoused on treatment completion [4, 5, 10, 12, 20, 21].

A majority of studies have indicated that the type of substance used was predictive of SUD treatment outcomes; however, the specific type of substance identified varied amongst these studies [8,9,16, 22-26].

Previous studies also examined the role of number of days of primary substance use during the 30 days prior to admission related to SUD treatment outcomes, concluding that days of drug use in

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the 30 days prior to admission was predictive of SUD treatment noncompletion [10, 19, 27]. Furthermore, low scores on motivational assessments were consistently determined to be predictive of SUD treatment noncompletion across a variety of treatment settings [28-36].

Multiple studies have identified developmental trauma and victimization trauma as a predictive factor in the noncompletion of SUD treatment [33, 37-41]. Researchers have examined the role of treatment of psychiatric issues related to SUD treatment outcomes with mixed results; moreover, the manner in which these studies operationalize treatment of psychiatric issues consistently varies [4, 37,42-45].

This study seeks to further our understanding of the traumatic experiences and co-occurring psychiatric disorders related to residential LTR SUD treatment outcomes among individuals who meet DSM-5 criteria for moderate to severe SUDs, addressing several limitations in the literature. First, research exploring predictive factors of SUD treatment retention for persons with co-occurring psychiatric disorders is limited, has yielded mixed results, and includes differing operationalized definitions of psychiatric conditions and treatment. Second, this study expands upon previous research by focusing on predictive factors of treatment completion in the LTR SUD treatment setting rather than inpatient hospital, short-term residential, intensive outpatient, and outpatient levels of care. Finally, unlike previous research, this study also examines predictors of specific types of treatment dispositions, such as treatment completion, treatment completion and continuation at a lower level of care, administrative discharge, and treatment abandonment.

Materials and Method

To address these gaps, this study examined a de-identified dataset provided by a local non-profit agency, which provides publicly funded residential SUD treatment services at the 3.1 and 3.5 American Society of Addiction Medicine (ASAM) Level of Care (LOC) for clients enrolled in or eligible for Medicaid or a county-based no-cost health insurance plan for low-income individuals in a large urban county. This dataset included all of the information recorded in the ASAM Multidimensional Assessment and the treatment disposition, prognosis, and aftercare services listed in the Discharge/Transfer Form. The central research focus for this analysis was to determine the predictive factors of LTR SUD treatment disposition. This research was approved by the IRB.

Sample

Inclusion criteria: The sample includes all clients admitted into an abstinence-based residential treatment facility located in a large urban county between August 1, 2017, and March 1, 2018. These clients all possessed or were eligible for Medicaid, a county-based no-cost health insurance plan for low-income individuals, or participants in county funded programs for persons who are indigent or involved with the criminal justice or child welfare system; aged 18 and older; and were residents of the large urban county for at least the past 60 days prior to their assessment. Additionally, all of the clients in the sample met the criteria for a DSM-5 SUD with a moderate or severe specifier. The dataset includes 200 clients (n = 200).

Exclusion criteria: As this residential SUD treatment facility is not authorized to provide services to minors, no minors were included in the sample. Clients seeking treatment who tested positive for opiates, alcohol, or benzodiazepines at the time of assessment were also excluded from this study, as they were referred to treatment at facilities licensed to provide withdrawal management (WM) services. Furthermore, this residential SUD treatment facility operates in English; therefore, there were no monolingual non-English speakers receiving services in this sample.

Measures

LTR SUD treatment disposition: The dependent variable of interest in this study was the client's LTR SUD treatment disposition, which was documented by their primary AOD Counselor on their SAPC Discharge/Transfer form. The form includes ten possible categorical outcomes, including 1 = Completed treatment goals/plan at this level of care, 2 = Completed treatment goals/plan at this level of care and transferred, 3 = Left before completing treatment goals/plan, 4 = Left before completing treatment goals/plan and transferred, 5 = Voluntary, 6 = Administrative discharge, 7 = Discharged into other, more appropriate system of care, 8 = Death, 9 = Incarceration, and 10 = Other. Categories with less than 10% of the sample population (n = 20) were collapsed. As a result, the following five categories remained: 1 = Completed treatment goals/plan at this level of care, 2 = Completed treatment goals/plan at this level of care and transferred, 3 = Left before completing treatment goals/plan, 4 = Administrative Discharge, and 5 = Other. This outcome variable was further collapsed into 1 = Completed treatment and 2 = Did not complete treatment in order to conduct binary logistic regression analyses.

Pretreatment substance use: Primary Substance Used was constructed based on participants' reported primary substance used during the intake process. Participants were able to select MA, marijuana, alcohol, heroin/opiates, cocaine/crack cocaine, sedatives, PCP, and other. Categories with less than 10% of the sample size (n = 20) were collapsed. As a result, the following categories remained: MA, marijuana, alcohol, heroin/opiates, and other.

Number of days of primary substance use in past 30 days was a continuous variable constructed for all participants based on the number of days they reported using their primary substance used out of the past 30 days.

Trauma history

History of Abuse was a dichotomous variable constructed based on participants' responses to, "Have you ever experienced physical, emotional, or sexual abuse in your lifetime?" The variable was coded 0 = no, for participants who did not report a history of abuse, and 1 = yes, for participants who reported a history of abuse.

Mental health

Presence and Treatment of Psychiatric Conditions was a categorical variable constructed through performing Ward's Method of Cluster Analysis. Four distinct classifications emerged regarding the presence and treatment of psychiatric conditions. The first grouping included participants who did not report any significant psychiatric symptoms or history of receipt of mental health services. The second grouping included participants who reported psychiatric symptoms, including psychotic symptoms, and had a history of receipt of mental health services. The third grouping included participants who reported psychiatric symptoms, excluding psychotic symptoms, and had a history of receipt of mental health services. The fourth grouping included participants who reported psychiatric symptoms but denied a history of mental health services.

Number of Inpatient Psychiatric Hospitalizations was continuous variable constructed for all participants based on the number of days they reported previous inpatient psychiatric hospitalizations in their lifetime.

Readiness for change

Dimension 4 Severity Rating was a categorical variable coded as 0 = None - "Willing to engage in treatment," 1 = Mild - "Willing to enter treatment but ambivalent to the need to change," 2 = Moderate - "Reluctant to agree to treatment; low commitment to change substance use; passive engagement in treatment," 3 = Severe - "Unaware of need to change; unwilling or partially able to follow through with recommendations for treatment," and 4 = Very Severe - "Not willing to change; unwilling/unable to follow through with treatment recommendations." Each participant was assigned one of the aforementioned ratings based on the clinician's perception of one's "Readiness to Change." Categories with less than 10% of the sample size (n = 20) were collapsed. As a result, the following categories remained: None, Mild, Moderate, and Severe.[1]

Sociodemographic variables

Gender was a dichotomous variable was coded male = 1, female = 2. Since only one transgender woman and no transgender men entered treatment during the course of the study, the transgender woman was collapsed into the category "female."

Race/ethnicity was a categorical variable constructed from participants' responses to "How do you identify in terms of race or ethnicity?" The variable was coded as 1 = Caucasian, 2 = Black, 3 = Latine, 4 = Asian/Pacific Islander, 5 = Native American, 6 = Multiracial, and 7 = Other. Categories with less than 10% of the sample population were collapsed. As a result, the following four categories remained: 1 = Caucasian, 2 = Black, 3 = Latine, and 4 = Other.

Age was a continuous variable calculated by subtracting birth year, month, and day from the intake date to residential SUD treatment.

Living Arrangement was categorical variable coded as 1 = unhoused, 2 = independent living, and 3 = other. As none of the participants reported "other," the variable was collapsed into 1 = homeless and 2 = independent living.

Analysis

Descriptive information including means, standard deviations and frequencies were generated for all variables in the dataset (Table 1). Correlations and/or associations were produced for all the variables in the study. Since the majority of the variables in the dataset were categorical, associations were presented (Tables 2 and 3). For the continuous variables, correlations were provided.

Binary and multinomial logistic regression was used to determine the predictors of LTR SUD treatment disposition (Tables 4 and 5). This study examined the role of substance use, trauma, mental health, readiness for change, and self-medication for psychiatric distress to predict treatment disposition. The following sociodemographic variables also were included in the analysis: gender, race/ethnicity, age, living arrangements, educational attainment, forensic status, and child welfare status. SPSS 25 was used to conduct the statistical analyses.

Variable selection approach: The number of variables in this study was considerable, let alone the number of parameter estimates. As a result, user determined hierarchical regression was conducted. Variables significant at $p < .05$ for each conceptual domain were included in the full model.

[1]Readiness to Change was further collapsed into 0 = None, 1 = Mild to Moderate, and 2 = Severe to Very Severe, which was used in analyses involving smaller sample sizes and/or dependent variables with multiple categorical or ordinal outcomes.

Table 1: Descriptive statistics.

	Means/SD or percent (n)
Gender	
Male	60% (120)
Female	40% (80)
Race/Ethnicity	
Caucasian	29% (58)
Black	28.5% (57)
Latine	36% (72)
Other	6.5% (13)
Age	
	36.62; SD = 11.20
Living Arrangements	
Homeless	60.5% (121)
Independent Living	39.5% (79)
Primary Substance Used	
Alcohol	17% (34)
Marijuana	5.5% (11)
Cocaine/Crack Cocaine	8% (16)
Methamphetamine	59.5% (119)
Heroin/Opiates	8.5% (17)
Other	1.5% (3)
Past 30-Day Use of Primary Substance Used	
Presence and Treatment of Psychiatric Conditions	
No Psychiatric Symptoms/ No History of MH Services	35.5% (71)
Psychiatric Symptoms (w/ psychosis) and MH Services	19% (38)
Psychiatric Symptoms (w/o psychosis) and MH Services	30% (60)
Psychiatric Symptoms/No MH Services	15.5% (31)
Number of Inpatient Psychiatric Episodes	
History of Abuse	
Yes	46.5% (93)
No	53.5% (107)
Dimension 4 Severity Rating	
None	15.5% (31)
Mild	47% (94)
Moderate	32% (64)
Severe	5.5% (11)
Treatment Disposition	
Completed treatment goals/plan at this level of care	20.5% (41)
Completed treatment goals/plan at this level of care and transferred	27% (54)
Left before completing treatment goals/plan	33% (66)
Administrative Discharge	11.5% (23)
Other	8% (16)

Results

Descriptive statistics

The final sample of 200 participants consisted of mostly males (60%). The participants reported their race/ethnicity as White (29%), Black (28.5%), Latine (36%), and Other (6.5%). Ages ranged from 20 to 83 years, with an average age of 36.6 years. A majority of the participants (60.5%) did not have stable living arrangements and reported being homeless. A majority of the participants (59.5%) were admitted for stimulant use disorder - amphetamine type substance followed by alcohol use disorder (17%). For the 30 days prior to entering treatment, participants reported an average of 14.6 days in which they used their primary substance.

A majority of participants (53.5%) reported history of at least one mental health treatment service with an average of 1.04 (SD = 3.228)

Table 2: Binary logistic regression of treatment completion.

Variable	Odds Ratio	Significance	Lower	Upper
Gender (Male – Reference)	.511	.140	.210	1.246
Age	1.011	.550	.976	1.047
Race – Non-Hispanic White (Reference)		.136		
Black	1.933	.208	.693	5.391
Latine	3.075	.019	1.204	7.855
Other	1.902	.397	.430	8.408
Living Arrangement (Not Homeless – Reference)	1.295	.497	.614	2.730
Readiness for Change (None: Willing to Enter Treatment – Reference)		**.029**		
Mild: Willing to Enter Treatment, Ambivalent to Need to Change	1.411	.534	.477	4.176
Moderate: Reluctant to Enter Treatment, Low Commitment to Change, Passive Engagement in Treatment	3.222	**.043**	1.082	10.018
Severe: Unaware of Need to Change/Not Willing to Change, Unwilling or Unable to Follow through with Treatment Recommendation	9.949	**.027**	1.336	76.218
Mental Health Treatment and Symptoms – (No Psychiatric Disorders, No History of Treatment – Reference)		**.009**		
Serious Mental Illness (including psychosis) and History of Mental Health Treatment	.711	.542	.239	2.122
Serious Mental Illness (including psychosis) and No Mental Health Treatment	5.238	**.008**	1.549	17.715
Any Mental Illness (excluding psychosis) and History of Mental Health Treatment	2.096	.127	.760	5.422
Number of Inpatient Psychiatric Episodes	1.375	**.018**	1.056	1.789
History of Abuse	1.992	.148	.782	5.072
Primary Drug of Choice (Alcohol -Reference)		.068		
Marijuana	6.597	.046	1.035	42.050
Methamphetamine	3.480	.019	1.228	9.865
Heroin/Opiates	7.853	.009	1.689	36.508
Other Drugs	2.825	.163	.657	12.153
Past 30-Day Use of Primary DOC	1.069	**>.001**	1.035	1.104
*The base category is Completed Treatment.				

Table 3: Multinomial logistic regression of type of treatment outcome.

	Completed Treatment	Did Not Complete Treatment	Percentage Correct
Completed Treatment	69	26	72.6%
Did Not Complete Treatment	25	80	76.2%
Overall Percentage			74.5%

Table 4: Pseudo R-Square.

Nagelkerke	.376
Primary DOC Days of Use (Past 30 Days)	**.001**
Living Arrangement (Not Homeless – Reference)	.055
Race (White – Reference)	.062
Readiness for Change Severity Level (Low: Willing to Enter Treatment – Reference)	.098
Number of Inpatient Psychiatric Episodes	**.001**
Primary Drug of Choice (Reference – Depressants)	.502
Mental Health Treatment and Symptoms	**.047**

acute inpatient psychiatric hospitalization episodes. While 21.5% of participants reported history of few to no psychiatric symptoms, 20.5% reported symptoms of serious mental illness (SMI) and were not receiving mental health services. The remainder of the participants (n = 98) reported symptoms of SMI or any mental illness (AMI) and had history of mental health services. Almost half of the participants (46.5%) reported a history of abuse.

At baseline, almost half of the participants (47%) received a severity rating of "mild," willing to enter treatment but ambivalent to the need to change, on Dimension 4 - Readiness for Change. Only 15.5% of participants received a severity rating of "none," willing to engage in treatment. On the other hand, 32% of participants received a rating of "moderate," reluctant to agree to treatment or low commitment to change, and 5.5% of participants received severity ratings of "severe or very severe," unaware of need to change or unwilling to change. Almost half of the participants (47.5%) successfully completed their residential SUD treatment episode. However, 33% of the participants left treatment, 11.5% received an administrative discharge from treatment, and 8% of the participants were unable to complete treatment for other reasons.

Inferential statistics

Predicting residential SUD treatment completion vs. noncompletion: Given the relatively large number of predictors, binary logistic regression was conducted for each of the six conceptual blocks (e.g. sociodemographic, substance use, mental health, traumatic exposure, readiness for change variables, and self-medication for psychiatric distress, respectively. Within each of the blocks, those predictors that were significantly associated with treatment noncompletion at the $p < .05$ level were entered into the corresponding binary logistic regression analysis. The significant predictors emerging from the six respective conceptual blocks include: living arrangement ($p < .026$), past 30 days of primary substance used ($p < .003$), number of inpatient psychiatric episodes ($p < .015$), mental health symptoms and treatment ($p < .003$), and Dimension 4 Severity rating ($p < .003$). However, none of the variables in the traumatic exposure block were significant.

A test of the model using all of the aforementioned predictor

Table 5: Likelihood ratio tests.

Variable	Odds Ratio	Significance	Lower	Upper
Completed Treatment and Transferred				
Primary DOC Days of Use	.993	.704	.956	1.031
Living Arrangement (Not Homeless – Reference)	2.360	.053	.988	5.636
Race (White – Reference)	.887	.805	.343	2.298
Readiness for Change – (Low: Willing to Participate – Reference)	.947	.914	.335	2.528
Primary DOC (Reference – Depressants)	1.328	.524	.555	3.182
Number of Inpatient Psychiatric Episodes	1.346	.295	.771	2.350
Serious Mental Illness with Treatment	.580	.387	.170	1.988
Limited Mental Health Symptoms w/ no History of Treatment	1.055	.923	.353	3.157
Serious Mental Illness without Treatment	2.228	.407	.336	14.782
Any Mental Illness with Treatment - Reference				
Left Treatment				
Primary DOC Days of Use	1.058	**.005**	1.017	1.101
Living Arrangement (Not Homeless – Reference)	2.645	.040	1.045	6.693
Race (White – Reference)	1.814	.262	.640	5.139
Readiness for Change – (Low: Willing to Participate – Reference)	2.218	.112	.830	5.923
Primary DOC (Reference – Depressants)	1.090	.854	.435	2.736
Number of Inpatient Psychiatric Episodes	1.865	**.025**	1.080	3.219
Serious Mental Illness with Treatment	.198	**.019**	.052	.764
Limited Mental Health Symptoms w/ no History of Treatment	.544	.289	.177	1.675
Serious Mental Illness without Treatment	2.843	.251	.477	16.930
Any Mental Illness with Treatment - Reference				
Administrative Discharge				
Primary DOC Days of Use	1.068	**.014**	1.013	1.126
Living Arrangement (Not Homeless – Reference)	4.842	.015	1.355	17.306
Race (White – Reference)	5.506	.035	1.126	26.910
Readiness for Change – (Low: Willing to Participate – Reference)	3.176	.067	.922	10.938
Primary DOC (Reference – Depressants)	.551	.357	.155	1.958
Number of Inpatient Psychiatric Episodes	1.898	**.026**	1.080	3.336
Serious Mental Illness with Treatment	.051	**.017**	.004	.592
Limited Mental Health Symptoms w/ no History of Treatment	.426	.254	.099	1.844
Serious Mental Illness without Treatment	2.739	.330	.361	20.791
Any Mental Illness with Treatment - Reference				
*The base category is Completed Treatment.				

variables as well as race, gender, type of primary substance used, and history of abuse was significant ($p < .001$) with a R^2 value of .419 [46]. This model shown in Table 2 correctly predicted whether participants completed or did not complete residential SUD treatment for 74.5% of the participants.

Significant predictor variables of residential SUD treatment noncompletion at $p < .05$ were past 30 days of use of primary substance used reported at intake (OR = 1.069, $p < .001$), mental health treatment and symptoms ($p < .01$), number of inpatient psychiatric episodes (OR = 1.375, $p < .019$), and readiness for change ($p < .03$).

When considering the past 30 days of use of primary substance used, the odds ratio of 1.069 reveals that for each additional day the participant used one's primary substance in the past 30 days, one's odds of not completing residential SUD treatment increases by 6.9%. In comparison to those participants who reported no history of psychiatric symptoms or treatment, participants who reported symptoms of SMI and no history of mental health treatment were 5.238 times more likely ($p < .009$) to not complete residential SUD treatment. However, participants who reported both SMI and AMI and a history of mental health treatment were not significantly more likely to be unable to complete residential SUD treatment. For number of inpatient psychiatric episodes, the odds ratio of 1.375 indicates that for each additional inpatient psychiatric episode, the individual's odds of not completing residential SUD treatment increases by 37.5%. In regard to readiness for change, clients who received a rating of "Moderate" (Reluctant to Enter Treatment, Low Commitment to Change, Passive Engagement in Treatment) were 3.222 times more likely ($p < .043$) to not complete residential SUD treatment compared to clients who received a rating of "None" (Willing to Enter Treatment). Furthermore, clients who received a rating of "Severe" (Unaware of Need to Change/ Not Willing to Change, Unwilling or Unable to Follow through with Treatment Recommendation) were 9.949 times more likely ($p < .027$) to fail to complete residential SUD treatment compared to clients who received a rating of "None" (Willing to Enter Treatment).

Predicting type of residential SUD treatment outcome: The same significant variables that emerged from the aforementioned six conceptual blocks were included in the multinomial logistic regression. The four treatment outcomes for this analysis included completed residential SUD treatment, completed residential SUD treatment and transferred to a lower level of SUD care, left residential SUD treatment, and administrative discharge from residential SUD treatment. As a consequence, those participants who left residential SUD treatment and transferred to another treatment facility, were incarcerated, or hospitalized were not included in this analysis, resulting in only 184 of the 200 participants being included in this analysis.

A test of the model using all of the aforementioned predictor variables as well as race, gender, and history of abuse was significant ($p < .001$) with a R^2 value of .376 [46], as seen in Table 3. Based on the likelihood ratio tests, the following variables were found to be significant in predicting participants' treatment outcomes: past 30 days of use of primary substance used reported at intake ($p < .002$), number of inpatient psychiatric episodes ($p < .002$), and mental health treatment and symptoms ($p < .048$).

Predictive factors of completing and transferring: There were no significant predictors for participants who completed residential SUD treatment and transferred to a lower level of SUD care compared to those participants who completed residential SUD treatment and did not pursue aftercare services.

Predictive factors of leaving LTR SUD treatment: For past 30 days of use of primary substance used, the odds ratio of 1.058 reveals that for each additional day the participant used one's primary substance in the past 30 days, one's odds of leaving residential SUD treatment increases by 5.8% compared to those participants who completed residential SUD treatment. In regards to number of inpatient psychiatric episodes, the odds ratio of 1.865 indicates that for each additional inpatient psychiatric episode, the individual's odds of leaving residential SUD treatment increases by 86.5% in comparison to those participants who completed residential SUD treatment. In contrast to participants with history of AMI and mental health services, participants with history of SMI and mental health services were significantly less likely to leave residential SUD treatment (OR = .19) when compared to participants who completed SUD treatment.

Predictive factors of administrative discharge from LTR SUD treatment: For past 30 days of use of primary substance used, the odds ratio of 1.068 reveals that for each additional day the participant used one's primary substance in the past 30 days, one's odds of receiving an administrative discharge from residential SUD treatment increases by 6.8% compared to those participants who completed residential SUD treatment. In regards to number of inpatient psychiatric episodes, the odds ratio of 1.898 indicates that for each additional inpatient psychiatric episode, the individual's odds of receiving an administrative discharge from residential SUD treatment increases by 89.8% in comparison to those participants who completed residential SUD treatment. Compared to participants with history of AMI and mental health services, participants with history of SMI and mental health services were significantly less likely to receive an administrative discharge from residential SUD treatment (OR = .051).

Discussion

The findings from the bivariate model for predicting residential SUD treatment noncompletion indicate that ratings for readiness for change, presence of mental health symptoms and treatment, number of lifetime inpatient psychiatric episodes, and past 30-day use of primary substance used at time of admission significantly influenced treatment noncompletion.

The final bivariate model indicates that treatment non-completers are more likely to receive a rating of "Moderate: Reluctant to Enter Treatment, Low Commitment to Change, Passive Engagement in Treatment," or "Severe: Unaware of Need to Change/Not Willing to Change, Unwilling or Unable to Follow through with Treatment Recommendation" as compared to participants who received ratings of "None: Willing to Enter Treatment" or "Mild: Willing to Enter Treatment, Ambivalent to Need to Change." With the exception of two studies that found that pretreatment measures of readiness to change were not predictive of SUD treatment outcomes [47, 48], the results from the present study coincide with the majority of previous research, which consistently found higher pretreatment motivation to be predictive of treatment retention and completion [28-36].

The results reveal that treatment non-completers are more likely to present with symptoms of SMI and have no history of mental health treatment compared to participants who do not present with symptoms of mental illness or have symptoms of SMI or AMI, but who have a history of mental health treatment. These findings are consistent with the majority of previous reports, which found that clients diagnosed with co-occurring SUDs and Bipolar Disorder [20] and clients diagnosed with co-occurring SUDs and psychotic disorders [49, 50] were less likely to complete SUD treatment compared to clients without a history of psychiatric conditions. Such findings suggest that the stabilization of severe psychiatric symptoms and the provision of mental health services prior to entering a residential SUD treatment episode might improve LTR SUD treatment completion for clients with CODs.

Similarly, the results also indicate that for each additional acute inpatient psychiatric hospitalization episode, participants were 37.5% more likely to not complete treatment. A previous study by Amodeo and colleagues [4] also found that clients with history of psychiatric inpatient hospitalization or outpatient mental health services in the past five years was predictive of treatment attrition. Repeated need for acute psychiatric hospitalization indicates a high severity of mental illness as well as ongoing difficulty in stabilizing psychiatric symptoms. Ensuring that clients diagnosed with SMI who complete acute inpatient psychiatric hospitalization episodes transition to residential mental health treatment in the community as well as their subsequent initiation of outpatient mental health services would enhance mental health stability and improve the likelihood of clients with CODs successfully completing LTR SUD treatment.

Finally, the results suggest that for each additional day of use of the participant's primary substance used in the 30 days prior to admission, participants were 6.9% more likely to not complete treatment. These findings are consistent with previous research findings, which have overwhelmingly established higher frequency of pretreatment substance use as a predictive factor of attrition from SUD treatment [6, 10, 11, 19, 27, 51-55]. These findings illustrate the importance of clients who have been using their primary substance for the majority of the past 30 days to initiate WM services prior to transitioning to LTR SUD treatment to minimize withdrawal symptoms and severe cravings and improve neurological functioning.

Treatment noncompletion was not predicted by socio-demographics of the participants, nor was it impacted by their primary substance used. With the exception of gender being nonpredictive of noncompletion, these results are somewhat surprising given that past research has consistently established that younger age [6, 7, 9, 14-16] identifying as a person of color [4,8,10,14], and being unhoused [10, 18], respectively, were predictive of treatment noncompletion.

While previous research has established that participants whose primary substance used was alcohol had a greater likelihood of completion treatment [10, 12, 14, 16, 22-25, 56, 57], primary substance used was not predictive of attrition from residential SUD treatment in this study. However, the present finding that frequency of use was more predictive of residential SUD treatment outcome than the type of substance used supports the earlier findings of Butzin and colleagues

[58, 59]. These findings are encouraging as ascribed characteristics and circumstances outside of a patient's immediate control were not shown to affect one's ability to successfully complete residential SUD treatment among Medicaid eligible clients with severe SUDs at this facility [60].

There were no predictive factors for participants completing treatment and transferring to a lower level of care as compared to completing treatment. However, the findings from the multivariate logistic regression model indicate that past 30 days of use of primary substance used, number of lifetime acute inpatient psychiatric episodes, and presence of mental health treatment and symptoms significantly predicted participants abandoning residential SUD treatment and receiving administrative discharges from residential SUD treatment compared to participants completing treatment, respectively.

For each additional day of use of the primary substance used, participants were 5.8% more likely to abandon residential SUD treatment and 6.8% more likely to receive an administrative discharge from residential SUD treatment compared to participants who completed residential SUD treatment. These results further reinforce the importance of WM for clients who report a high level of pretreatment substance use, including MA, in the 30-days preceding their assessment. Proper WM protocol would assist participants to manage the physiological and psychological symptoms of withdrawal and enhance their level of stability and functioning prior to transitioning to a residential SUD treatment setting and increase their likelihood of successfully completing residential SUD treatment.

For each additional acute inpatient psychiatric episode reported, participants were 86.5% more likely to abandon residential SUD treatment and 89.98% more likely to receive an administrative discharge from residential SUD treatment, respectively. As clients with a history of multiple acute psychiatric hospitalizations struggle to remain in a clinically managed residential SUD treatment setting, such as 3.1 and 3.5 LOC, clients who report repeated psychiatric hospitalization at time of assessment should be referred to 3.3 LOC facilities, clinically managed population-specific high intensity residential. While some states offer 3.7 LOC, medically monitored intensive inpatient services, and 4.0 LOC, medically managed intensive inpatient services, respectively, many states do not. Therefore, states with a sizeable population of indigent residents with co-occurring SMI and severe SUDs should submit proposals for waivers for behavioral health provisions to include 3.7 and 4.0 LOCs in the continuum of care offered to Medicaid clients with SUDs.

The results indicate that participants who report that they have been diagnosed with a SMI and were receiving treatment for their psychiatric condition(s) at the time of treatment were significantly less likely to abandon residential SUD treatment or to receive an administrative discharge from residential SUD treatment. While previous studies have found that history of mental health services was not predictive of treatment noncompletion [37, 42,43, 45], no previous studies have established that mental health treatment for clients with SMI decreased the likelihood of attrition. These findings demonstrate that clients who utilized mental health services and were actively treating their psychiatric symptoms were able to successfully function in this residential SUD treatment setting. Future research should continue to examine the role of mental health stabilization in LTR SUD treatment outcomes. Furthermore, these findings may support the importance of decreasing barriers and increasing access to mental health services for the Medicaid population to ensure that clients with CODs can realize the benefits of their LTR SUD treatment episodes. Possible approaches include the use of case managers, community mental health workers, and social workers as well as assistance for clients in acute psychiatric settings to enroll in residential and outpatient mental health services following their discharge and promotion of the use of long-term injectables for clients with psychotic symptoms.

Conclusion

The results should be interpreted in light of several considerations. The dataset included clients from one large urban county, so the results cannot be generalized to all persons participating in residential or inpatient substance use treatment programs. Additionally, the participants in this sample overwhelmingly reported MA as their primary substance used. There also may have been biases in the self-reported information related to pretreatment substance use, psychiatric history, and trauma history included in the ASAM Multidimensional Assessment Tool due to social desirability and recall.

The findings indicate that pretreatment assessment factors related primarily to the severity of substance use and untreated psychiatric symptoms, respectively, were highly predictive of both treatment completion as well as type of treatment outcome. Therefore, AOD Counselors and clinicians should focus on these factors in determining the proper LOC, as clients whose withdrawal symptoms and/or psychiatric symptoms have not been sufficiently stabilized prior to entering residential SUD treatment tend to receive administrative discharges or abandon treatment.

The present study raises important policy and programmatic implications for LTR SUD treatment. First, clients reporting high levels of pretreatment substance use, including MA, at time of assessment should be referred to WM, when available, to decrease the likelihood of treatment noncompletion. Second, residential SUD treatment facilities serving the Medicaid population should provide integrated behavioral health care by becoming Co-Occurring Enhanced facilities. Finally, clients with CODs preparing to discharge from inpatient psychiatric hospitalization episodes should be linked to residential mental health treatment facilities or outpatient mental health providers and have scheduled follow-up visits prior to the completion of their treatment episodes to enhance the continuity of their care.

The findings of the present study also have important policy implications related to the expansion of ASAM LOCs and states' submission of 1115 Section Waivers for residential mental health treatment facilities as well as IMD Care proposals to increase availability of SUD treatment services, including LTR SUD treatment. First, the SUPPORT for Clients and Communities Act should be revised to mandate that states provide at least one ASAM level of inpatient care, either 3.7 or 4.0 LOC. Second, as only 10 states have applied for and received an IMD Payment Exclusion for mental health treatment to enhance access to residential mental health treatment for the Medicaid population, other states must follow suit and submit these. Finally, currently 34 states possess IMD Payment Exclusions for SUD treatment; the remaining states should submit proposals to expand their behavioral health services for the Medicaid population and participate in Medicaid expansion given the supportive disposition of the Biden Administration.

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