Center for Practice
TRANSFORMATION

UNIVERSITY OF MINNESOTA

NUWAY® Program Evaluation Report: Year 4 (through August 3, 2023)

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Acknowledgement

Program Evaluation Aims

NUWAY House, Inc. (NUWAY®), a Minnesota-based nonprofit treatment organization contracted with the Center for Practice Transformation (CPT) at the University of Minnesota as an independent and objective evaluator (supporting participant enrollment, data collection, and data analysis) of their Recovery in Supportive Environments (R.I.S.E.) program in 2019. This report represents findings using data collected over the course of the project through August 2023 and addresses these core aims:

1. To understand the characteristics of people who choose to live in a recovery residence while receiving intensive outpatient (IOP) treatment compared to those who do not.

2. To understand the impact of living in a recovery residence during IOP treatment on client retention and outcomes, such as discharge status, substance use, self-care, relationship problems, material resources, life outlook, depression severity, anxiety severity, and sober days.

Significance

- 46.3 million people aged 12 or older (or 16.5 percent of the population) met the applicable DSM-5 criteria for having a substance use disorder in the past year (SAMHSA, 2021 National Survey on Drug Use and Health).

- Approximately 9.2 million adults in the United States live with a co-occurring mental health and substance use disorder (SAMHSA, 2021 National Survey on Drug Use and Health).

- Historically, recovery from substance use disorders has been understood as abstinence from substance use. This has expanded to encompass other measurable areas including increased quality of life, decreased psychiatric symptoms, increased coping ability, employment, and positive relationships with friends and family (Bjornestad et al., 2020). There has also been an increased emphasis on recovery as an ongoing process, rather than a discrete event.

- Although recovery housing, an intervention designed to address a person's need for a safe and supportive living environment (SAMHSA, 2021 National Survey on Drug Use and Health), has been shown to have benefits for people recovering from co-occurring disorders (Mericle et al., 2019; Reif et al., 2014), systematic research on this housing intervention has been limited.

Executive Summary

WHAT WAS THE EVALUATION DESIGN?

EVALUATION QUESTIONS

Who chooses to live in a recovery residence while receiving intensive outpatient (IOP) treatment compared to those who do not?

What is the impact of living in a recovery residence during IOP treatment on client retention and outcomes, such as discharge status, substance use, self-care, relationship problems, material resources, life outlook, depression severity, anxiety severity, and sober days?

INTAKE SURVEY	DISCHARGE SURVEY	THREE-MONTH SURVEY	NINE-MONTH SURVEY	SIXTEEN-MONTH SURVEY
At time of IOP intake, NUWAY clients can enroll in evaluation with NUWAY staff. To enroll participants must be enrolled in an IOP at NUWAY and be 18 or older. No gift card is received at this time point.	At the time of discharge, clients who had been enrolled in an IOP for at least two weeks are able to complete all future surveys. Participants receive a $10 electronic gift card	Three-month surveys are distributed to participants via e-mail and CPT staff follow up with phone calls. Participants receive a $20 electronic gift card	Nine-month surveys are distributed to participants via e-mail and CPT staff follow up with phone calls. Participants receive a $20 electronic gift card	Sixteen-month surveys are distributed to participants via e-mail and CPT staff follow up with phone calls. Participants receive a $20 electronic gift card
6,301 surveys completed	**1,623** surveys completed (25.8% of completed intake surveys)	**1,109** surveys completed (17.6% of completed intake surveys)	**728** surveys completed (11.6% of completed intake surveys)	**497** surveys completed (7.9% of completed intake surveys)

Outcome scales (SURE, PHQ-9, and GAD-7) and last date of use collected at every time point.
IOP treatment engagement length collected at all time points after Intake.

5 NUWAY® locations have participated in enrolling clients in the evaluation since August of 2019

R.I.S.E. pairs intensive-outpatient (IOP) treatment with stipend supported recovery residence housing for clients in need of a safe recovery environment.

For more info: https://www.nuway.org/nuway-history/

WHO WAS IN THE EVALUATION?

Numbers represent known sample of participants. (n=6,301)

35.3 yrs	**15.7 yrs**	**4.8 episodes**	**42 days**
Average age	*Average age of first substance use*	*Average number of prior treatment episodes for SUD*	*Median number of days sober at intake*

Gender

64.4%	33.9%
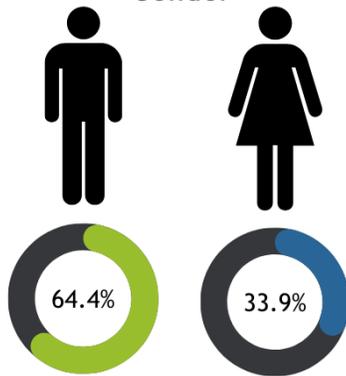
1.6% of participants identified at Transgender, Genderqueer, or Other

Education level below Bachelor's	**91%**
Court-ordered to IOP treatment	**26.1%**
History of a felony	**44.4%**
Unhoused in past 6 months	**49.6%**

RACE AND ETHNICITY

- White
- Black/African American
- American Indian/Alaska Native
- Asian
- Native Hawaiian/Other Pacific Islander
- Other

0.0% 20.0% 40.0% 60.0% 80.0%

Latinx/Hispanic
6.5%

Not Latinx/Hispanic
93.5%
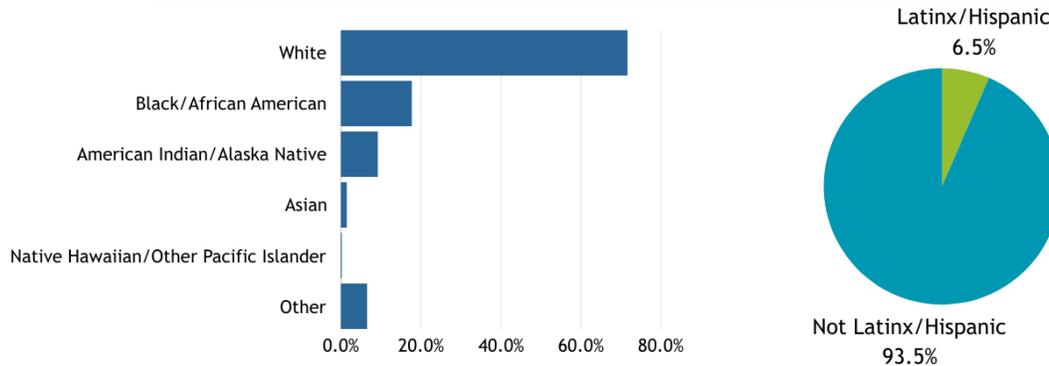
SUBSTANCE USE

Top five most commonly used substances

50.9%	49.6%	41.1%	26.7%	12.4%
Alcohol	**Amphetamines**	**Cannabis**	**Opioids**	**Cocaine**
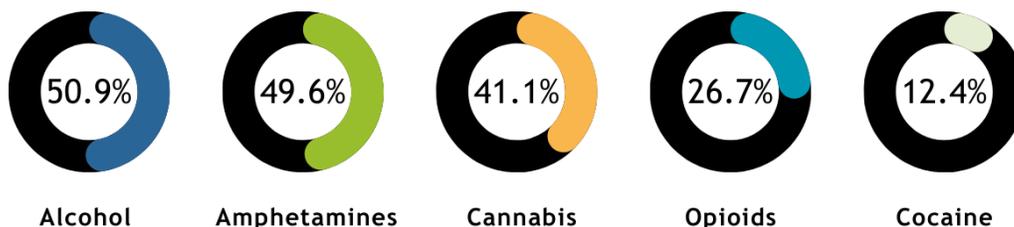
61.4%   *Used more than one substance*

Treatment setting prior to IOP

Inpatient, residential, hospital setting	▇▇▇▇▇▇▇▇▇
None	▇▇
Other outpatient	▇
Other	▇

0.0% 10.0% 20.0% 30.0% 40.0% 50.0% 60.0% 70.0%
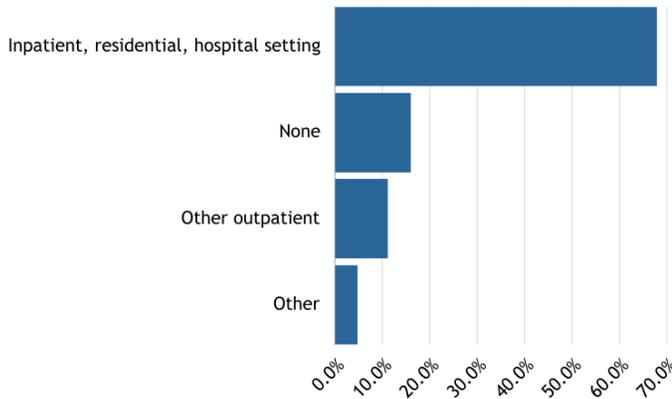
Number of prior substance use treatment attempts

0 Attempts
9.6%

4+ Attempts
47.2%

1-3 Attempts
43.3%
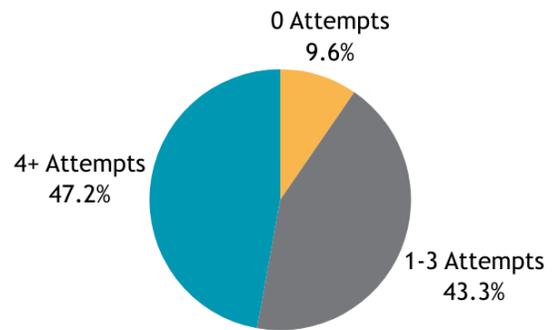
MENTAL HEALTH

Top five self-reported diagnostic categories

Anxiety	▇▇▇▇▇▇▇
Depression	▇▇▇▇▇▇
PTSD	▇▇▇▇
ADHD/ADD	▇▇▇
Bipolar	▇▇

0.0%   20.0%   40.0%   60.0%   80.0%
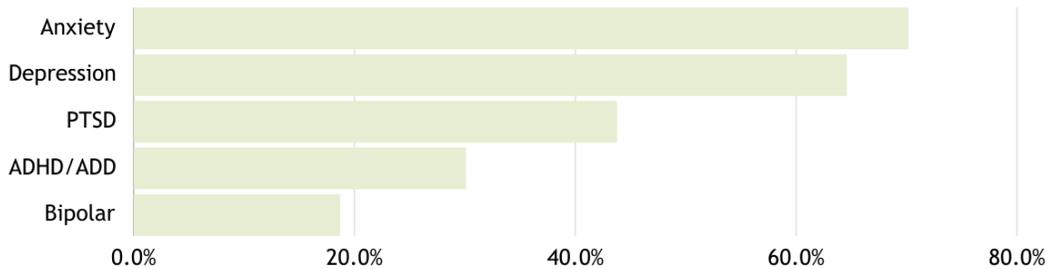
Outcome scales at Intake

■ None-minimal ■ Mild ■ Moderate ■ Moderately severe ■ Severe

PHQ-9- Depression Severity	
GAD-7- Anxiety Severity	

0.0%   20.0%   40.0%   60.0%   80.0%   100.0%
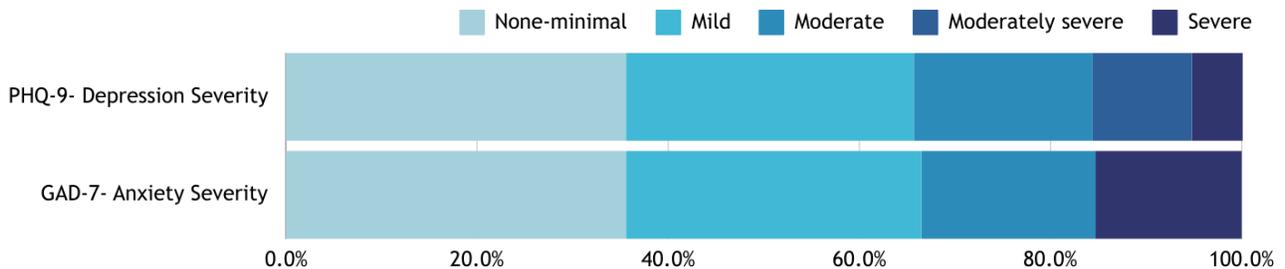
Mean Substance Use Recovery Evaluator (SURE) Total score at Intake

53.2

Scale range between:

21   and   63
(Lowest possible recovery score)   *(Highest possible recovery score)*

SURE Domains: Drinking and Drug Use, Self-Care, Relationships, Material Resources, and Outlook on Life

WHO ENROLLED IN RECOVERY HOUSING DURING IOP TREATMENT?

Table 1.a. Summary of associations between participant demographics and recovery housing participation

Key Characteristic	…compared to …	More or less likely to enroll in recovery housing*
Females	Males	Less likely to enroll
Black only and multiracial	White only	Less likely to enroll
Felony history	No felony history	Less likely to enroll
H.S diploma/G.E.D., Some college	Some high school	More likely to enroll
Prior treatment in inpatient/hospital setting/ detox setting, or Outpatient	No prior IOP treatment admission	More likely to enroll
Unhoused in the last six months	Housed for the last six months	More likely to enroll
Four or more prior treatment episodes for substance use	No prior treatment episodes for substance use	More likely to enroll
Reports 15 or more days sober** at time of intake	Reports 0-14 days sober	More likely to enroll

* Associations have been adjusted to account for confounding variables. For an overview of all associations and adjustments, refer to Table 4.a-d.

** Defined as days elapsed since last use of a substance

WHAT WAS THE IMPACT OF RECOVERY HOUSING PARTICIPATION WHILE IN IOP TREATMENT?

Significant findings (p<0.05) are summarized below.
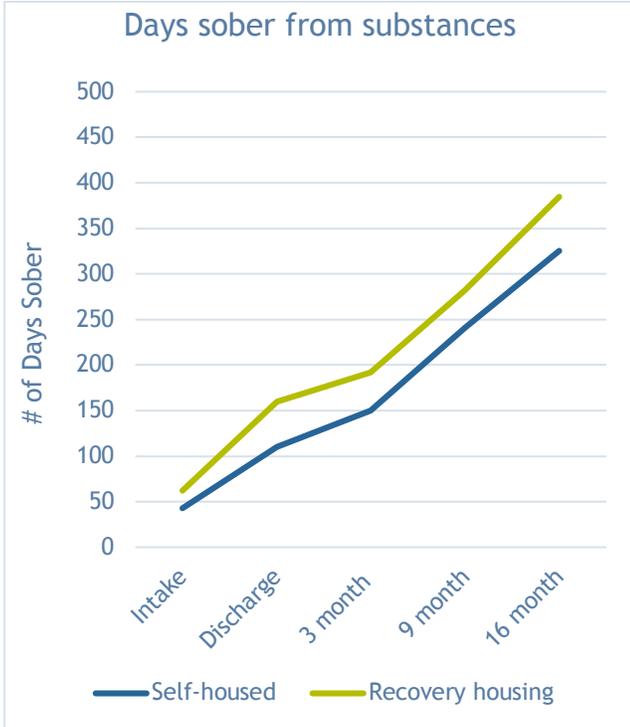
Days sober from substances

Compared to self-housed participants, those who lived in a recovery residence increased an average of **19 more days of sobriety from intake to 16 months post discharge.**

Compared to self-housed participants, those who lived in a recovery residence were **3.8 times more likely to have an increase in days sober from intake to discharge.**

Compared to self-housed participants, those who lived in a recovery residence were **1.3 times more likely to have a successful discharge**.
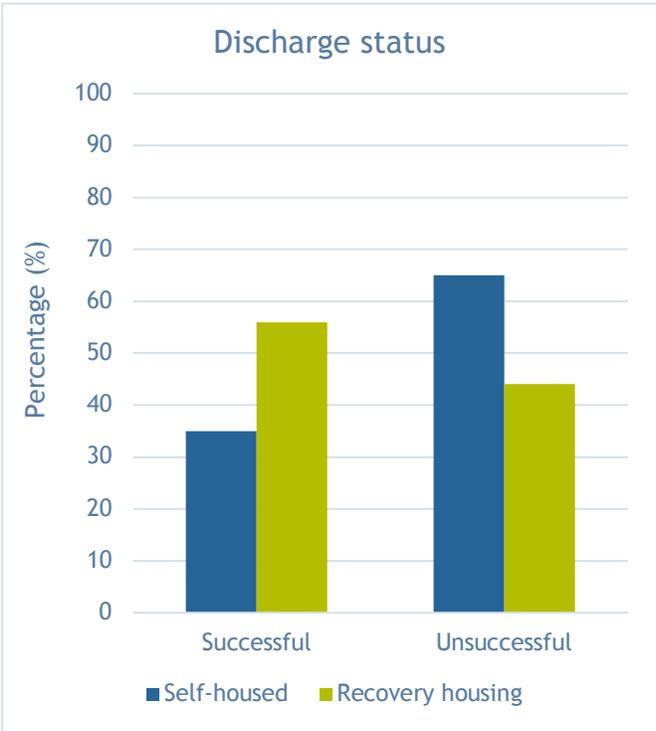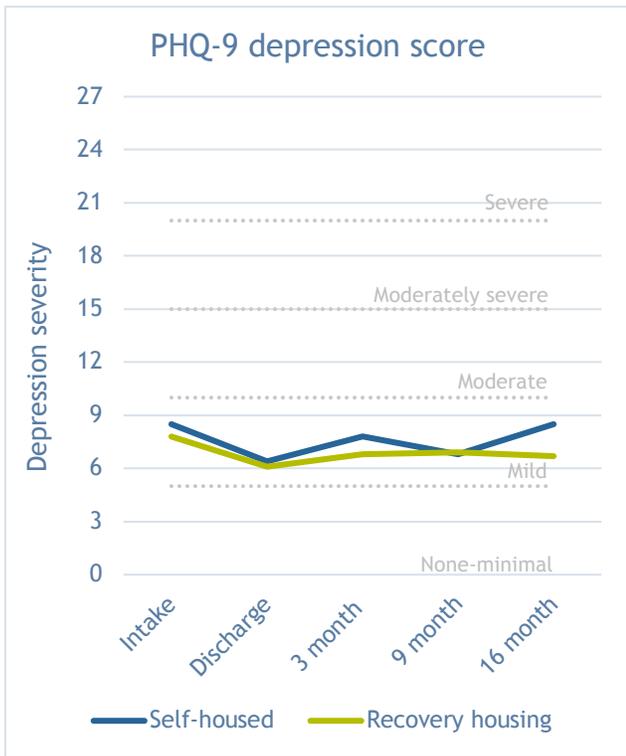
Discharge status

PHQ-9 depression score

Depression severity

Score	Label
27	
24	
21	Severe
18	
15	Moderately severe
12	
9	Moderate
6	Mild
3	
0	None-minimal

Intake · Discharge · 3 month · 9 month · 16 month

— Self-housed — Recovery housing

Compared to self-housed participants, those who lived in a recovery residence **were 1.3 times more likely to have an improved PHQ-9 depression score from intake to discharge.**

There were no significant differences between housing groups in score changes from intake to 16 months or likelihood of score improvement from intake to discharge on the SURE and GAD-7.

Substance Use Recovery Evaluator (SURE)- total score

Recovery (higher = higher recovery)

63
57
51
45
39
33
27
21

Intake | Discharge | 3 month | 9 month | 16 month

— Self-housed — Recovery housing

Substance Use Recovery Evaluator (SURE) substance use and cravings

Substance use and cravings (higher = less use)

9
8
7
6
5
4
3

Intake | Discharge | 3 month | 9 month | 16 month

— Self-housed — Recovery housing

GAD-7 anxiety score

Anxiety severity

21
18
15 .... Severe
12
9 .... Moderate
6
3 .... Mild
0 None-minimal

Intake | Discharge | 3 month | 9 month | 16 month

— Self-housed — Recovery housing

Evaluation Methods

PARTICIPANT ENROLLMENT AND DATA COLLECTION

Participant enrollment began in August of 2019 and enrollment is ongoing. Clients 18 or older receiving treatment at any intensive outpatient program (IOP) at five NUWAY® counseling centers (2118 NUWAY Counseling Center, 3Rs NUWAY Counseling Center, NUWAY-University Counseling Center, NUWAY-Rochester Counseling Center, and NUWAY-Duluth Counseling Center) were eligible for the evaluation. Participants were enrolled in the evaluation during their admission appointment at NUWAY®. Admissions staff provided a description of the evaluation to potential participants and obtained consent along with a release of information document so that CPT staff could retrieve data from their electronic health record in Procentive. After obtaining consent, admission staff administered an electronic survey to participants including demographic questions and several standardized outcome scales (see below). Participants were also given instructions about how to enroll in the study independently at a later time if they were not ready to do so during their admission appointment. Clients were only able to enroll in the evaluation one time.

Data was collected from participants at five time points: admission to the IOP, discharge from the IOP, three months after discharge from the IOP, nine months after discharge from the IOP, and sixteen months after discharge from the IOP. At the time of their discharge, clients who had been enrolled in an IOP for at least two weeks were encouraged by their counselor to complete another electronic survey during their discharge planning meeting. If a client left treatment without completing the survey with their counselor, either because they left treatment early or they did not have time to complete the survey in their discharge meeting, CPT staff distributed the survey via the client's email address provided at intake. Three-month, nine-month, and sixteen-month surveys were all distributed to participants via e-mail (with up to three e-mail reminders) and CPT staff followed up with participants with telephone calls (up to two calls) as needed to further encourage them to complete surveys. Participants who completed surveys at discharge, three months, nine months, and sixteen months received electronic gift cards as a thank you for their time. Gift cards were valued at $10 for discharge surveys and $20 for each follow-up survey.

About a quarter (25.8%) (n=1623) of participants who completed a survey at admission (6301) completed a discharge survey, 17.6% (n=1109) completed a three-month survey, 11.6% (n=728) completed a nine-month survey, and 7.9% (n=497) a sixteen-month survey.

DEMOGRAPHIC INFORMATION

Demographic information was collected from two sources: the NUWAY® electronic medical record (Procentive), and from participant-completed Qualtrics surveys maintained by the University of Minnesota (Table 2.a). These included age, sex, gender identity, race, ethnicity, education level, marital status, employment status, recent substances used, prior treatment history, self-reported psychiatric diagnosis category, legal history, and housing history.

Table 2.a: Demographic information, the data source, and the time point of collection

Variable	Intake Survey	EMR- Procentive		Discharge Survey	Three Month Survey	Nine Month Survey	Sixteen Month Survey
		Intake	Discharge				
Sex		✓					
Gender Identity		✓					
Intake Date		✓					
Discharge Date and status			✓				
Marital Status		✓					
Employment Status		✓					
Race		✓					
Ethnicity		✓					
Health Insurance			✓				
Mental Health Diagnosis	✓						
Level of education	✓						
Prior treatment setting	✓						
Prior housing status	✓						
Homelessness status	✓						
Legal status	✓						
R.I.S.E. participation				✓	✓	✓	✓
R.I.S.E. length of participation				✓	✓	✓	✓
Prior treatment episodes	✓						
Housing status following Discharge				✓	✓	✓	✓
Food security				✓	✓	✓	✓
Last date of use	✓			✓	✓	✓	✓
Substance Used	✓						
Age started substances	✓						
Current treatment services					✓	✓	✓
SURE Scale, PHQ-9, and GAD-7	✓			✓	✓	✓	✓

OUTCOMES

Outcomes included: days sober, IOP treatment engagement length (days), IOP discharge status, drinking and drug use (as assessed on the SURE), self-care (SURE), relationship quality (SURE), material resources (SURE), outlook on life (SURE), recovery importance (SURE), food insecurity, depression severity (as assessed on the PHQ-9), and anxiety severity (as assessed on the GAD-7).

Patient recorded outcome measures

Substance Use Recovery Evaluator (SURE): The Substance Use Recovery Evaluator (SURE) is a 21-item psychometrically-tested self-reported measure (Neale et al., 2016), developed with input from people in recovery. The SURE measure uses Likert style responses and requires participants to respond using their experiences over the last week. It measures several domains: total (score range: 21-63), drinking and drug use (6-18), self-care (5-15), relationships (4-12), material resources (3-9), outlook on life (3-9), and recovery importance (optional). Higher scores indicate a higher degree of recovery. The SURE can be found using this link: https://www.kcl.ac.uk/ioppn/depts/addictions/scales-measures-and-instruments/sure-substance-use-recovery-evaluator

Patient Health Questionnaire (PHQ-9): The PHQ-9 is a nine-item psychometrically tested self-reported measure of depression (Kroenke, Spitzer & Williams, 2001). The PHQ-9 uses a Likert scale from "0" (not at all) to "3" (nearly every day) and asks about the last two weeks. The total score ranges from 0 to 27 with higher scores indicating higher severity. An additional item in the PHQ-9 asks about impairment among those who indicated that they have experienced symptoms. The PHQ-9 can be found using this link: https://www.apa.org/depression-guideline/patient-health-questionnaire.pdf

Generalized Anxiety Disorder scale (GAD-7): The GAD-7 is a seven-item psychometrically-tested self-reported measure of anxiety (Spitzer at al., 2006). The GAD-7 uses a Likert scale from "0" (not at all) to "3" (nearly every day) and asks about the last two weeks. The total score ranges from 0 to 21 with higher scores indicating higher severity. An additional item in the GAD-7 asks about impairment among those who indicated that they have experienced symptoms. The GAD-7 can be found using this link: https://adaa.org/sites/default/files/GAD-7_Anxiety-updated_0.pdf

STATISTICAL ANALYSIS

To answer the question of who enrolls in recovery housing while in IOP versus not, unadjusted logistic regression models were first used to explore the associations between participation in recovery housing and participant characteristics (unadjusted odds ratios and 95% confidence intervals were generated). Then, where there were statistically significant relationships in unadjusted models, adjusted multiple logistic regression models were used to examine the relationship between the participant characteristic and recovery housing participation while accounting for possible confounding variables. For each characteristic that had a significant unadjusted association, confounding variables were selected if there was a significant association between the characteristic and the variable as measured by chi-square tests of independence (p<0.05).

To quantify the effect of recovery housing participation on outcomes, linear growth curve models were fit to available data. These models fit a line to each participant's data across time, to model their overall level on outcome variables (reflected in the intercept of the line) as well as their change in the outcome variables (that is, increase or decrease, reflected in the slope) from intake to 16-month follow-up. This allows for a comparison of whether

recovery housing participants differed from non-participants (e.g., self-housed) in their overall level (intercept) as well as change from IOP intake to discharge (slope) on the outcomes. A significant difference in change (slope) between recovery housing and non-participant groups would be suggestive of a treatment effect.

In addition, for some analyses, simple binary increases or decreases in outcome variables (for example, did someone decrease in their substance use or not from intake to discharge) were modeled as a function of recovery housing status. This addresses the more straightforward question of whether or not recovery housing participants changed in one direction in an outcome more than non-participants.

To address differences between average recovery housing participant and non-participant backgrounds in analyses, propensity-based weighting was used. This method uses a variety of background variables to assign each participant a predicted probability of recovery housing membership based on those background variables, and then reweights each participant in analyses based on those probabilities, so as to estimate what would have been observed if the recovery housing and non-participants were identical in background characteristics. In the current analyses, weights based on the following background variables were used: sex, race, education, prior treatment history, felony history, and homelessness history.

All available data was used in analyses to fit models. Linear growth curves were fit using full-information maximum likelihood, and binary change variables were fit using generalized linear models with a binomial link function.

Who was in the evaluation?

Table 3.a-d describe demographic characteristics of 6,301 participants who have enrolled in the evaluation since 2019. Unless otherwise specified, characteristics are from the intake time point. In summary, the mean age of study participants was 35.3 years old, and the majority of those for whom demographics were known were male (65.9%) and cis-gendered men (64.4%). Almost a third (28.3%) were non-White and most (83.7%) had attained a high school degree/G.E.D. or higher. Upon discharge from the IOP, more than three-quarters of participants (77.6%) identified as single, and the majority (81%) reported that they were unemployed.

On average, participants were 15.7 years old when they first used a substance and averaged almost five (4.8) prior treatment episodes for a substance use disorder. The most commonly used substances in the past year were alcohol (50.9%), amphetamines (49.6%), and cannabis (41.1%). Participants reported that the most common non-substance use disorder diagnostic categories they had received were an anxiety disorder (70.2%), depressive disorder (64.6%), and post-traumatic stress disorder (43.8%). The majority of participants (67.9%) had been in an inpatient, residential, or hospital setting prior to the IOP admission when they enrolled in the study, and just over a quarter (26.1%) were court-ordered to treatment. Almost half (44.4%) of participants had a felony history and the median number of self-reported days sober from a substance was 42 days. Almost half (49.6%) had been unhoused in the past six months, and over half (55.5%) reported living in a recovery residence prior to their IOP intake (this included people who had already enrolled into a recovery residence prior to their actual intake).

Only 30.7% and 33.5% of participants reported moderate or more severe depression and anxiety symptoms, respectively, which might be at least somewhat surprising given that they are at an intensive outpatient level of care. Mean scores of the SURE recovery scale also tended to be quite high: total (53.2/63), drinking and drug use (16.1/18), self-care (12.2/15), relationships (11.1/12), material resources (6.6/9), and outlook on life (7.3/9).

Table 3.a. Demographic characteristics of evaluation participants, descriptive (n = 6301)

	N (or mean)	% of total sample (or range/SD)	% of known sample
Age	35.3 years	18-73 (SD=10)	
Sex			
Male	2652	42.1	65.9
Female	1374	21.8	34.1
Unknown	2275	36.1	
Gender identity			
Man	2344	37.2	64.4
Woman	1236	19.6	33.9
Transgender (Male to Female)	12	0.2	0.3
Transgender (Female to Male)	22	0.3	0.6
Genderqueer	20	0.3	0.5
Other	7	0.1	0.2
Unknown	2660	42.2	
Race			
White	2871	45.6	71.7
Black/African American	712	11.3	17.8
American Indian/Alaska Native	372	5.9	9.3
Asian	61	1.0	1.5
Native Hawaiian/Other Pacific Islander	13	0.2	0.3
Other	264	4.2	6.6
Unknown	2297	36.5	
Ethnicity			
Latinx/Hispanic	244	3.9	6.5
Not Latinx/Hispanic	3508	55.7	93.5
Unknown	5284	40.5	
Educational attainment			
Some high school	1025	16.3	16.3
High school diploma or G.E.D.	2075	32.9	33.0
Some college	1981	31.4	31.5
Associates/Technical degree	643	10.2	10.2
Bachelors	410	6.5	6.5
Some graduate	76	1.2	1.2
Graduate degree	84	1.3	1.3
Unknown	7	0.1	

Table 3.b. Demographic characteristics of evaluation participants, substance use and mental health (n = 6301)

	N (or mean)	% of total sample (or range/SD)	% of known sample
Age of first substance use	15.7 years	1-66 (SD=5.4)	
# prior treatment episodes for SUD	4.8 episodes	0-80 (SD=5.4)	
Substances used in past year (up to 3)			
Alcohol	3202	50.8	50.9
Amphetamines	3124	49.6	49.6
Cannabis	2584	41.0	41.1
Opioids	1679	26.6	26.7
Cocaine	779	12.4	12.4
Sedatives	391	6.2	6.2
Hallucinogens	210	3.3	3.3
Inhalants	33	0.5	0.5
Phencyclidines	32	0.5	0.5
Unknown	7	0.1	
Used >1 type of substance	3863	61.3	61.4
Self-reported diagnostic categories			
Anxiety	4029	63.9	70.2
Depression	3711	58.9	64.6
PTSD	2517	39.9	43.8
ADHD/ADD	1728	27.4	30.1
Bipolar	1073	17.0	18.7
Personality	601	9.5	10.5
Schizophrenia/Schizoaffective	329	5.2	5.7
Eating	215	3.4	3.7
None	735	11.7	12.8
Unknown	560	8.9	
Court-ordered to IOP treatment			
No	4651	73.8	73.9
Yes	1643	26.1	26.1
Unknown	7	0.1	
Treatment setting prior to IOP			
None	1009	16.0	16.0
Inpatient, residential, hospital setting	4273	67.8	67.9
Other outpatient	708	11.2	11.2
Other	304	4.8	4.8
Unknown	7	0.1	
Days Sober			
0-14 days (14 = 25th percentile)	952	15.1	26.9
15-42 days (42 = 50th percentile)	942	15.0	26.6
43-82 days (82 = 75th percentile)	884	14.0	24.9
Above 82 days	768	12.2	21.7
Unknown	2755	43.7	

Table 3.c. Demographic characteristics of evaluation participants, measure outcomes (n = 6301)	N (or mean)	% of total sample (or range/SD)	% of known sample
PHQ-9 Depression severity (0-27)			
	Mean = 7.8	0-27 (SD=6.3)	
None-minimal (0-4)	2238	35.5	35.6
Mild (5-9)	1892	30.0	30.1
Moderate (10-14)	1174	18.6	18.7
Moderately severe (15-19)	655	10.4	10.4
Severe (20-27)	333	5.3	5.3
Unknown	9	0.1	
Mild or less (10>)	4130		69.3
Moderate or worse (depressive disorder) (10<)	1829		30.7
GAD-7 Anxiety severity (0-21)			
	Mean = 7.6	0-21 (SD=6)	
None-minimal (0-4)	2238	35.5	35.6
Mild (5-9)	1944	30.9	30.9
Moderate (10-14)	1145	18.2	18.2
Severe (15-21)	963	15.3	15.3
Unknown	11	0.2	
Mild or less (10>)	4182		66.5
Moderate or worse (anxiety disorder) (10<)	2108		33.5
SURE Total score (21-63)			
	Mean = 53.2	21-63 (SD=8.8)	
21-48 (48 = 25th percentile)	1579	25.1	25.1
49-56 (56 = 50th percentile)	1755	27.9	27.9
57-60 (60 = 75th percentile)	1582	25.1	25.1
Above 60	1378	21.9	21.9
Unknown	7	0.1	
SURE Drinking and Drug Use score (6-18)	Mean = 16.1	6-18 (SD=2.7)	
SURE Self-Care score (5-15)	Mean = 12.2	5-15 (SD=3.1)	
SURE Relationships score (4-12)	Mean = 11.1	4-12 (SD=1.8)	
SURE Material Resources score (3-9)	Mean = 6.6	3-9 (SD=1.9)	
SURE Outlook on Life (3-9)	Mean = 7.3	3-9 (SD=2.1)	

Table 3.d. Demographic characteristics of evaluation participants, psychosocial (n = 6301)	N (or mean)	% of total sample (or range/SD)	% of known sample
Marital status (at IOP discharge)			
Single	3080	48.9	77.6
Former relationship			
Divorced	495	7.9	12.5
Separated	124	2.0	3.1
Widowed	41	0.7	1.0
Current relationship			
Married	193	3.1	4.9
Partner	38	0.6	1.0
Unknown	2330	37.0	
Employment status (at IOP discharge)			
Not working			
Not employed	3262	51.8	81.0
Disabled	78	1.2	1.9
Retired	16	0.3	0.4
Employed full-time	322	5.1	8.0
Employed part-time	258	4.1	6.4
Unknown	2303	36.6	
History of felony			
No	3501	55.6	55.6
Yes	2793	44.3	44.4
Unknown	7	0.1	
Housing before IOP admission			
Recovery residence	3217	51.1	55.5
Living with others	1197	19.0	20.7
No permanent address/unhoused	753	12.0	13.0
Living alone	423	6.7	7.3
Other	202	3.2	3.5
Unknown	509	8.1	
Unhoused in the past 6 months			
No	3170	50.3	50.4
Yes	3124	49.6	49.6
Unknown	7	0.1	

Who enrolled in recovery housing during IOP treatment?

On unadjusted models, females were less likely than males to enroll in recovery housing, Black only and multiracial participants were less likely than White only participants to enroll, and those with an associates/technical degree, some college, or a high school diploma/GED were more likely to enroll than those with only some high school (Table 4.a). When adjusting for possible confounding variables (see below each table for specific confounders for each characteristic), females remained less likely to enroll (aOR, 0.64, 0.48-0.84), Black only and multiracial participants remained less likely to enroll (aOR, 0.60, 0.40-0.88; aOR, 0.46, 0.28-0.76, respectively), and those with some college (aOR, 1.84, 1.10-3.09) or a high school diploma/GED (aOR, 1.80, 1.05-3.07) were more likely to enroll. In the adjusted model, those with an associates/technical degree were more likely to enroll, but this did not quite reach statistical significance (p=0.07).

On the unadjusted model, those who used their first substance at age 15 or older were less likely than those who first used when they were younger than 15 to enroll in recovery housing (Table 4.b). This association, however, was no longer significant when adjusting for confounders. Unadjusted, those who had one or more previous treatment attempts for a substance use disorder were more likely than those who had never had a previous treatment attempt to enroll. When adjusting for confounders, those with four or more previous treatment attempts (aOR, 3.52, 1.93-6.43) remained more likely to enroll, and those with 1-3 previous attempts were no longer significantly different but approached significance (p=0.08). Unadjusted, those who reported using alcohol as a drug of choice in the last year were more likely than those who did not to enroll in recovery housing. This association remained marginally significant when adjusting for confounders (p=0.06). In unadjusted models, those who had received inpatient, outpatient, or some other treatment prior to intake in the IOP compared with those who had not received any treatment were more likely to enroll in recovery housing. When adjusting for confounders, those who had received inpatient (aOR, 4.16, 2.62-6.59) or outpatient (aOR, 2.59, 1.46-4.60) treatment remained more likely to enroll. When adjusting for confounders, those with more than 14 days sober from a substance were more likely to enroll in recovery housing (15-42 days: aOR, 1.74, 1.05-2.89; 43-82 days: aOR, 1.73, 1.01-2.97; above 82 days: aOR, 2.67, 1.53-4.68) than those with 14 or fewer days.

Table 4.a. Associations between participant demographics and recovery housing participation (odds ratios and 95% CI)

Characteristic	Recovery housing		Self-housed		Unadjusted			Adjusted		
Sex	N =1413		N =359							
	n	%	*n*	%	OR	95% CI	*p*[a]	OR	95% CI	*p*[a]
Male	894	63.3	198	55.2	Ref					
Female	519	36.7	161	44.8	0.71	0.57-0.90	**	[b]0.64	0.48-0.84	**
Age	N =1761		N =427							
35 years >	948	53.8	239	56.0	Ref					
35+ years	813	46.2	188	44.0	1.09	0.88-1.35	0.43			
Race	N =1403		N =352							
White only	1034	73.7	205	58.2	Ref					
Black only	144	10.3	73	20.7	0.39	0.28-0.54	***	[c]0.60	0.40-0.88	*
Amer. Indian/Alaska Native only	71	5.1	18	5.1	0.78	0.46-1.34	0.37	1.00	0.53-1.89	0.99
Asian only	11	0.8	5	1.4	0.44	0.15-1.27	0.13	0.62	0.20-1.90	0.40
Other only	67	4.8	20	5.7	0.66	0.39-1.12	0.12	0.94	0.41-2.15	0.88
Multiracial	76	5.4	31	8.8	0.49	0.31-0.76	**	0.46	0.28-0.76	**
Ethnicity	N =1314		N =334							
Not Hispanic/Latinx	1232	93.8	310	92.8	Ref					
Hispanic/Latinx	82	6.2	24	7.2	0.86	0.54-1.38	0.53			
Education	N =1815		N =436							
Some H.S.	225	12.4	86	19.7	Ref					
H.S. diploma/GED	527	29.0	120	27.5	1.68	1.22-2.31	**	[d]1.80	1.05-3.07	*
Some college	647	35.7	138	31.7	1.79	1.32-2.44	***	1.84	1.10-3.09	*
Associates or technical degree	213	11.7	39	8.9	2.09	1.37-3.18	**	1.95	0.96-3.98	0.07
Bachelors	147	8.1	40	9.2	1.41	0.92-2.16	0.12	1.78	0.83-3.84	0.14
At least some graduate school	56	3.1	13	3.0	1.65	0.86-3.16	0.13	1.31	0.43-3.96	0.64

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for race, education, court ordered to treatment, felony history, age of first substance use, cannabis use, depression diagnosis(dx), anxiety dx, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, eating dx, personality dx, treatment setting prior to intake, PHQ-9 score, and GAD-7 score.

[c]Adjusted for sex, education, ethnicity, cannabis use, alcohol use, amphetamine use, cocaine use, sedative use, treatment setting prior to intake, anxiety dx, bipolar dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, unhoused in past 6 months, court ordered to treatment, felony history, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and SURE total score.

[d]Adjusted for age, sex, race, ethnicity, cannabis use, alcohol use, amphetamine use, sedative use, treatment setting prior to intake, schizophrenia/schizoaffective dx, ADD/ADHD dx, unhoused in past 6 months, court ordered to treatment, felony history, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and sober days.

Table 4.b. Associations between participant substance use characteristics and recovery housing participation (odds ratios and 95% CI)										
Characteristic	Recovery housing		Self-housed		Unadjusted			Adjusted		
Age of first substance use	*N* =1815		*N* =436							
	n	%	*n*	%	OR	95% CI	*p*[a]	OR	95% CI	*p*[a]
15>	867	47.8	185	42.4	Ref					
15+	945	52.2	251	57.6	0.80	0.65-0.99	*	[b]0.94	0.67-1.32	0.71
# of prior SUD treatment attempts	*N* =1815		*N* =436							
0	137	7.6	76	17.4	Ref					
1-3	754	41.5	207	47.5	2.00	1.47-2.78	***	[c]1.65	0.95-2.88	0.08
4+	924	50.9	153	35.1	3.35	2.41-4.65	***	3.52	1.93-6.43	***
Past year substances used	*N* =1815		*N* =436							
Cannabis										
No	1087	59.9	243	55.7	Ref					
Yes	728	40.1	193	44.3	0.84	0.68-1.04	0.11			
Alcohol										
No	784	43.2	218	50.0	Ref					
Yes	1031	56.8	218	50.0	1.32	1.07-1.62	*	[d]1.50	0.99-2.26	0.06
Opioids										
No	1380	76.0	338	77.5	Ref					
Yes	435	24.0	98	22.5	1.09	0.85-1.40	0.51			
Amphetamines										
No	924	50.9	242	55.5	Ref					
Yes	891	41.1	194	44.5	1.20	0.98-1.48	0.09			
Cocaine										
No	1596	87.9	379	86.9	Ref					
Yes	219	12.1	57	13.1	0.91	0.67-1.25	0.57			
Sedatives										
No	1692	93.2	408	93.6	Ref					
Yes	123	6.8	28	6.4	1.06	0.69-1.62	0.79			
Treatment setting prior to intake	*N* =1815		*N* =436							
None	215	11.9	137	31.7	Ref					
Inpatient, hospital setting, detox	1330	73.3	215	49.3	3.97	3.07-5.14	***	[e]4.16	2.62-6.59	***
Other outpatient	202	11.1	57	13.0	2.28	1.58-3.27	***	2.59	1.46-4.60	**
Other	68	3.7	26	6.0	1.68	1.02-2.77	*	1.28	0.57-2.85	0.55

Table 4.b. Associations between participant substance use characteristics and recovery housing participation (odds ratios and 95% CI) (Continued)

Characteristic	Recovery housing		Self-housed		Unadjusted			Adjusted		
Days sober from a substance		N =847		N =247						
0-14 days (14 = 25th percentile)	162	19.1	106	42.9	Ref					
15-42 days (42 = 50th percentile)	244	28.8	53	21.5	3.01	2.05-4.43	***	[f]1.74	1.05-2.89	*
43-82 days (82 = 75th percentile)	225	26.6	49	19.8	3.01	2.03-4.46	***	1.73	1.01-2.97	*
Above 82 days	216	25.5	39	15.8	3.62	2.38-5.51	***	2.67	1.53-4.68	**

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for age, sex, race, education, cannabis use, opioid use, amphetamine use, cocaine use, sedative use, depression dx, anxiety dx, bipolar dx, PTSD dx, ADD/ADHD dx, personality dx, unhoused in the past 6 months, felony hx, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

[c]Adjusted for age, sex, race, ethnicity, education, cannabis use, opioid use, amphetamine use, treatment setting prior to intake, depression dx, anxiety dx, bipolar dx, PTSD dx, ADD/ADHD dx, eating dx, personality dx, unhoused in the past 6 months, felony hx, age of first substance use, PHQ-9 score, GAD-7 score, and sober days.

[d]Adjusted for age, race, education, opioid use, amphetamine use, sedative use, depression dx, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, personality dx, unhoused in the past 6 months, court ordered to treatment, felony hx, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and sober days.

[e]Adjusted for sex, race, education, cannabis use, opioid use, amphetamine use, sedative use, depression dx, anxiety dx, PTSD dx, ADD/ADHD dx, felony hx, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

[f]Adjusted for age, race, ethnicity, education, cannabis use, alcohol use, opioid use, amphetamine use, anxiety dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, court ordered to treatment, felony hx, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and SURE total score.

Unadjusted, those who reported being unhoused in the past six months were more likely to enroll in recovery housing than those who did not (Table 4.c). This association remained significant when adjusting for confounders (aOR, 2.69, 1.86-3.88). Unadjusted, those who were court ordered to treatment or with a felony history were both less likely to enroll in recovery housing compared to those not ordered or without a history, respectively. When adjusting for confounders, however, only those with felony history remained statistically less likely to enroll (aOR, 0.52, 0.35-0.77). Unadjusted, those who reported that they had been diagnosed with Schizophrenia/Schizoaffective disorder were less likely than those who did not to enroll in recovery housing. This association, however, was no longer significant when adjusting for confounders.

Although those with SURE total recovery scores higher than 48 were more likely than those with scores lower than 49 to enroll in recovery housing in an unadjusted model (Table 4.d), these associations were no longer significant when adjusting for confounders (note: in the next section on impact, data was analyzed in continuous form and found differences between groups).

Table 4.c. Associations between participant housing, legal, and psychiatric characteristics and recovery housing participation (odds ratios and 95% CI)										
Characteristic		**Recovery housing**		**Self-housed**		**Unadjusted**			**Adjusted**	
Unhoused in past 6 months		*N* =1815		*N* =436						
		n	%	*n*	%	OR	95% CI	*p*ᵃ	OR	95% CI *p*ᵃ
	No	888	48.9	295	67.7	Ref				
	Yes	927	51.1	141	32.3	2.18	1.75-2.72	***	ᵇ2.69	1.86-3.88 ***
Court ordered to treatment		*N* =1815		*N* =436						
	No	1410	77.7	284	65.1	Ref				
	Yes	405	22.3	152	34.9	0.54	0.43-0.67	***	ᶜ0.71	0.47-1.06 0.09
Convicted of a felony		*N* =1815		*N* =436						
	No	1108	61.1	242	55.5	Ref				
	Yes	707	38.9	194	45.5	0.80	0.65-0.98	*	ᵈ0.52	0.35-0.77 **

Characteristic	Recovery housing		Self-housed		Unadjusted			Adjusted		
Psychiatric diagnostic category	N =1606		N =395							
Depressive disorder										
No	514	32.0	126	31.9	Ref					
Yes	1092	68.0	269	68.1	1.00	0.79-1.26	0.97			
Anxiety disorder										
No	426	26.5	122	30.9	Ref					
Yes	1180	73.5	273	69.1	1.24	0.97-1.57	0.08			
Bipolar disorder										
No	1322	82.3	319	80.8	Ref					
Yes	284	17.7	76	19.2	0.90	0.68-1.19	0.47			
Posttraumatic stress disorder										
No	887	55.2	230	58.2	Ref					
Yes	719	44.8	165	41.8	1.13	0.90-1.41	0.28			
Schizophrenia/Schizoaffective										
No	1547	96.3	371	93.9	Ref					
Yes	59	3.7	24	6.1	0.59	0.36-0.96	*	[e]0.66	0.30-1.43	0.29
ADHD/ADD										
No	1130	70.4	282	71.4	Ref					
Yes	476	29.6	113	28.6	1.05	0.82-1.35	0.69			
Eating disorder										
No	1542	96.0	378	95.7	Ref					
Yes	64	4.0	17	4.3	0.92	0.53-1.59	0.77			
Personality disorder										
No	1430	89.0	363	91.7	Ref					
Yes	176	11.0	33	8.3	1.35	0.92-1.99	0.13			

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for age, race, education, alcohol use, opioid use, amphetamine use, sedative use, treatment setting prior to intake, depression dx, anxiety dx, bipolar dx, PTSD dx, ADD/ADHD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, personality dx, court ordered to treatment, felony hx, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

[c]Adjusted for age, sex, race, ethnicity, education, cannabis use, alcohol use, amphetamine use, cocaine use, sedative use, treatment setting prior to intake, depression dx, ADD/ADHD dx, schizophrenia/schizoaffective dx, unhoused in the last 6 months, felony hx, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

Table 4.d. Associations between self-reported measures and recovery housing participation (odds ratios and 95% CI)

Measure	Recovery housing		Self-housed		Unadjusted			Adjusted		
PHQ-9 Depression severity	*N* =1732		*N* =400							
	n	%	*n*	%	OR	95% CI	*p*[a]	OR	95% CI	*p*[a]
None or mild (<10)	1226	70.8	267	66.8	Ref					
Moderate or worse (10+)	506	29.2	133	33.3	0.88	0.66-1.05	0.11			
GAD-7 Anxiety severity	*N* =1815		*N* =436							
None or mild (<10)	1255	69.2	281	64.5	Ref					
Moderate or worse (10+)	560	30.9	155	35.6	0.81	0.65-1.01	0.06			
SURE total score (scale of 21-63)	*N* =1815		*N* =436							
21-48 (48 = 25th percentile)	357	19.7	128	29.4	Ref					
49-56 (56 = 50th percentile)	522	28.8	115	26.4	1.63	1.22-2.17	**	[b]1.38	0.84-2.28	0.20
57-60 (60 = 75th percentile)	479	26.4	106	24.3	1.62	1.21-2.17	**	0.97	0.55-1.71	0.92
Above 60	457	25.2	87	19.9	1.88	1.39-2.56	***	1.23	0.65-2.33	0.52

[a] *<0.05, **<0.01,***<0.001

What was the impact of recovery housing participation?

OVERALL RECOVERY

In terms of recovery as measured by SURE total score, recovery housing participants and non-participants differed significantly in their overall recovery across the study (difference in intercept α = 1.107; p=0.035) but did not differ in their level of change from intake to 16-month follow-up (difference in slope β = 0.002; p=0.457). This suggests that recovery housing participants had better recovery overall even at intake, but there were no differences between groups in their change in overall recovery. The results of the simple binary change (any improvement in score versus not) was consistent with this model: there were no significant differences between recovery housing participants and non-participants in their probability of showing an improvement in recovery from intake to discharge (p =0.18).

Other published subscales of the SURE (drinking and drug use, material resources, outlook on life, self-care, relationships) could not be modeled, nor could an item about food security. The reasons for this are unclear but may be related to a ceiling effect on the scales in that most participants reported near-maximum values for most of the subscales.

SUBSTANCE USE AND CRAVINGS

Substance use outcomes were examined using the subset of SURE items (first three questions of the drinking and drug use subscale) assessing reported use of and cravings for alcohol and drugs ("In the last week…I have drunk too much," "I have used street drugs," "I have experienced cravings"). As with the SURE total score, recovery housing participants and non-participants differed significantly in their reported substance use and cravings across the study period (difference in intercept α = 0.575; p = 0.002), but did not differ in their level of change from intake to 16-month follow-up (difference in slope β =-0.002; p = 0.193). The results of the simple binary change versus not was again also consistent with this model: there were no significant differences between recovery housing participants and non-participants in their probability of showing a decrease in problems from intake to discharge (p = 0.245).

Participants were also asked how many days they had remained sober. On this variable, recovery housing participants differed from non-participants both in their average days sober across the study period (difference in intercept α = 12.428; p = 0.020), as well as in their change from intake to 16-month follow-up (difference in slope β = 19.002; p =0.002). In particular, compared to self-housed participants, those who lived in a recovery residence increased an average of 19 more days of sobriety from intake to 16 months post discharge. The results of the simple binary change versus not was also consistent with this: there were significant differences between recovery housing participants and non-participants in their probability of showing increased sober days (p = 0.002), such that recovery housing participants were more likely to show an increase in sober days at discharge compared to intake. In particular, compared to self-housed participants, those who lived in a recovery residence were 3.8 times more likely to have any increase in days sober from intake to discharge.

DEPRESSION SEVERITY

Recovery housing participants and non-participants did not differ significantly in either their average reported PHQ-9 depression score across the study (difference in intercept α = -0.468; p= 0.280), or their average level of change from intake to 16-month follow-up (difference in slope β = -0.002; p = 0.144). However, the two groups did differ in whether they decreased in their level of depression at all from intake to discharge, in the analysis of simple binary change versus not: there were significant differences between recovery housing participants and non-participants in their probability of showing an improvement in depression from intake to discharge, with recovery housing participants being 1.3 times more likely to report a decrease in depression (p = 0.00245).

ANXIETY SEVERITY

As measured by the GAD-7, recovery housing participants appeared less anxious in general over the course of the study period (difference in intercept α =-0.533; p= 0.210), but there were no significant differences in changes between the two groups (difference in slope β = -0.002; p = 0.127). No significant differences were observed in analyses of binary change from intake to discharge either (p = 0.748).

DISCHARGE STATUS

Recovery housing participants were 1.3 times more likely to be discharged successfully (p< 0.0001) than non-participants, even when reweighting for background differences between the two groups. Discharge success was also predicted by days in care, such that individuals in care longer were more likely to be discharged successfully (p<0.0001). Supplementary analyses (receiver operating characteristic curve analyses) suggest that approximately 268 days in treatment is the minimal length of treatment predictive of successful discharge (e.g., below this reduces predictability of discharge success status) (Figure 1).

Figure 1. Predictive of successful discharge based on days in care
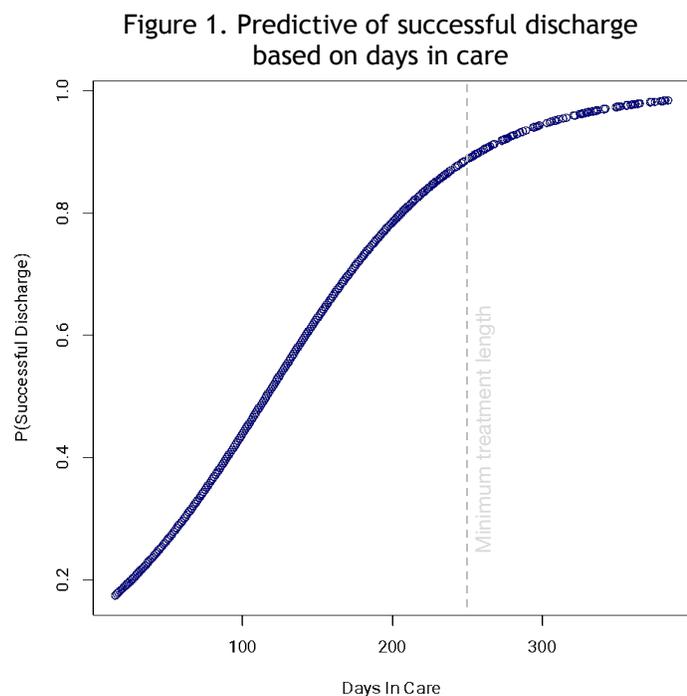
OUTCOMES BY INSURANCE PROVIDER

Outcomes were examined with four of the largest insurance providers covering participants in the program evaluation: UCare, Blue Cross Blue Shield (BCBS), Hennepin Healthcare, and Health Partners. In general, the effects within different providers were the same in direction and of similar magnitude as in the combined sample, although reduced sample size in each

group resulted in effects becoming less significant due to power. For example, with regard to days sober, in each of the four insurance groups, the recovery housing group reported more days sober on average across the study, and also showed greater increases in days sober from intake to later waves. However, due to loss of power associated with reduced sample size, these estimates were not significant. Similar patterns were observed for other variables examined. The only significant findings were the following: Average days sober were significantly greater in the recovery housing group over the entire study period for UCare and BCBS ($p=0.048$ and $p=0.002$, respectively), as in the combined sample. Also, the recovery housing group showed a greater probability of successful discharge ($p<0.05$) compared with non-participants for all four insurance providers.

Appendix: Research Briefs

PARTICIPATION IN RECOVERY HOUSING AND OUTCOMES AMONG PEOPLE WITH A FELONY HISTORY

Michael Van Wert, MPH, MSW, LICSW, Emily Gus, MPH

Abstract

People with a felony history face numerous challenges during reintegration post incarceration. The present research brief sought to determine characteristics of people with a felony history versus not, to what extent people with a felony history utilize recovery housing during treatment, the impact of recovery housing on treatment outcomes among people with a felony history, and to what extent people with a felony history utilize housing and treatment resources after discharge from treatment. It examined these areas in a sample of 6301 people receiving intensive outpatient services (IOP) for co-occurring substance use and mental health challenges. Participants with a felony history were more likely to be male, older, non-white, less educated, court-ordered to treatment, use amphetamines, report a diagnosis of PTSD or ADD/ADHD, have more previous treatment attempts for substance use, and first use a substance at a younger age. Moreover, those with a felony history were less likely than those without a history to enroll in recovery housing during treatment, but those who enrolled were more likely than those who had not to discharge "successfully" from the IOP, and to have more sober days upon discharge. Well below 50% of survey respondents with a felony history reported receiving professional services for a substance use disorder at three-month follow-up and beyond post IOP discharge. Supporting people with a felony history is key to creating healthier communities.

Background

Extensive research underscores the link between substance use and criminal charges, with 25-30% of individuals convicted of crimes admitting substance use involvement in their crimes (Bureau of Justice Statistics, n.d.). Over half of people incarcerated at the state and federal level meet *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV) criteria for drug dependence or abuse (Bureau of Justice Statistics, 2017). While a substantial portion of people who are incarcerated with substance use disorders participate in treatment programs within the criminal justice system (Bureau of Justice Statistics, 2021), upon reentry, they face challenges like housing insecurity and limited support, elevating the risk of recidivism, overdose (Waddell et al., 2020), and relapse (Baker, et al., 2023). Interviews with people who were recently on parole who are in recovery underscore the priority placed on maintaining sobriety, housing, and employment (Dong, et al., 2018).

To address these challenges, the integration of recovery-oriented housing programs for individuals with felonies shows capacity to positively impact communities. A study partnership between the Center for Practice Transformation and NUWAY®, a Midwest non-profit offering intensive outpatient programming (IOP) with a recovery residence option for those in need,

allows assessment of participant outcomes, such as days sober, recovery, and mental health symptoms, comparing participants convicted of a felony to participants without a felony. This study and program provide crucial insights into the efficacy of an integrated approach for people convicted of felonies.

The present brief sought to answer the following questions:
1) What differences exist in characteristics of people with a felony history versus not?
2) Compared to people without a felony history, to what extent do people with a felony history utilize recovery housing during IOP treatment?
3) Does utilization of recovery housing during IOP treatment impact outcomes for people with a felony history?
4) What housing and treatment resources are accessed after discharge from IOP by people with a felony history?

Methods

Clients (n=6301) receiving intensive outpatient (IOP) services at NUWAY® were given the option to enroll in the study at the time of their admission. Electronic surveys were completed at intake and discharge, and then at three, nine and sixteen months after discharge. Surveys included demographic questions and outcome-related questions. Identifying information was removed for analysis to protect the privacy of participants.

Statistical Analysis:

To examine the associations between felony history and other participant characteristics at intake, felony history and enrollment in a recovery residence, and felony history and outcomes from admission to discharge, logistic regression models were used (odds ratios and 95% confidence intervals were calculated, and significance was set at $p<0.05$). For associations between felony history and participant characteristics, regression analyses were first unadjusted. Then, where there were statistically significant relationships in unadjusted models, adjusted multiple logistic regression models were used to examine the relationship between the participant characteristic and felony history while accounting for possible confounding variables. For each characteristic that had a significant unadjusted association, confounding variables were selected if there was a significant association between the characteristic and the variable as measured by chi-square tests of independence ($p<0.05$).

For associations between felony history and recovery residence enrollment, the logistic regression model was adjusted for all other participant characteristics that were significantly associated with felony history as measured by chi-square tests of independence ($p<0.05$).

For analyses of improvement of outcomes (PHQ-9, GAD-7, SURE total score, sober days, discharge status) as a function of felony history and recovery residence participation, logistic regression models adjusted for participant characteristics that remained significantly associated with felony history in adjusted logistic regression models. Outcomes were all binary and included PHQ-9 (Kroenke, Spitzer & Williams, 2001) score improvement from admission to discharge (any vs. no improvement), GAD-7 (Spitzer at al., 2006) improvement (any vs. no improvement), SURE (Neale et al., 2016) total score improvement (any vs. no improvement),

discharge status ("successful" (with staff approval) vs. "unsuccessful" (against staff approval, transfer elsewhere, incarcerated, death)), and days sober from a substance at discharge (less than 139 days (median at discharge) vs. 139 days or more).

Results

What are the characteristics of people with a felony history?

See Tables 1-4 for participant characteristics. After adjusting for possible confounding characteristics, the following associations were found. Females (OR: 0.45, CI: 0.35-0.57) were less likely than males to have a felony history. Participants 35 years or older were more likely than those younger than 35 (OR: 2.16, CI: 1.77-2.64) to report a felony history. Compared to White only participants, those who were Black only (OR: 2.65, CI: 2.10-3.36), American Indian/Alaska native only (OR: 2.04, CI: 1.46-2.84), and multiracial (OR: 1.43, CI: 1.05-1.94) were more likely to report a felony history. Those who had completed at least some college or more were less likely than people with some high school to have a felony history.

Those who had used alcohol (OR: 0.55, CI: 0.44-0.68) and sedatives (OR: 0.56, CI: 0.41-0.77) in the past year were less likely than those who didn't to have a felony history. However, those who had used amphetamines (OR: 1.96, CI: 1.59-2.43) were more likely to have a felony history. Those who reported being 15 years or older when they first tried a substance were less likely to report a felony history (OR: 0.67, CI: 0.50-0.92) than those who were younger. Those who had four or more prior treatment attempts for substance use (OR: 3.43, CI: 1.79-6.57) were more likely than those with no prior attempts to have a felony history. Those who had been in an inpatient, hospital, or detox setting prior to their IOP intake were less likely (OR, 0.75, 0.56-0.98) than those who had not been in treatment to have a felony history. Moreover, those who were court ordered to IOP treatment (OR: 2.69, CI: 2.17-3.33) were more likely to have a felony history than those were not.

Those who reported being diagnosed with a diagnosis of PTSD (OR: 1.55, CI: 1.26-1.91), or ADD/ADHD (OR: 1.31, CI: 1.09-1.57) were more likely than those without those diagnoses to have a felony history. Although not quite significant (p=0.06), people diagnosed with an anxiety disorder were less likely to have a felony history. Similarly, although not significant (p=0.08), those with moderate or worse severity depression on the PHQ-9 were less likely to have a felony history.

To what extent do people with a felony history utilize recovery housing during IOP treatment?

Adjusting for possible confounders, compared to people without a felony history, people with a history were less likely to enroll in recovery housing during their IOP treatment engagement (OR: 0.52, CI: 0.35-0.77) (Table 5).

Does utilization of recovery housing during IOP treatment impact outcomes for people with a felony history?

Adjusting for possible confounders, participants with a felony history who enrolled in recovery housing were more likely than those who did not enroll to have 139 days or more of sobriety upon discharge (OR: 1.96, CI: 1.02-3.78) (Table 7). Similarly, participants with a felony history who enrolled in recovery housing were more likely than those who did not enroll to discharge
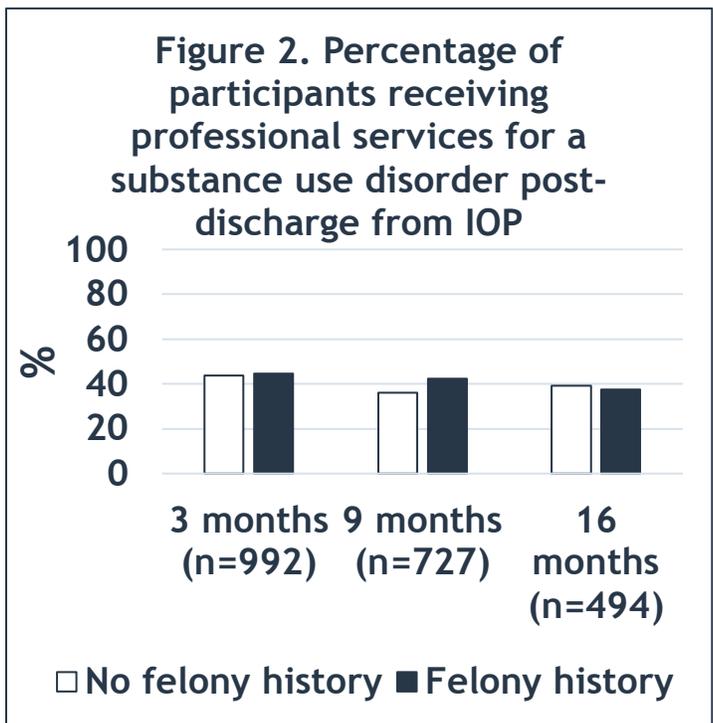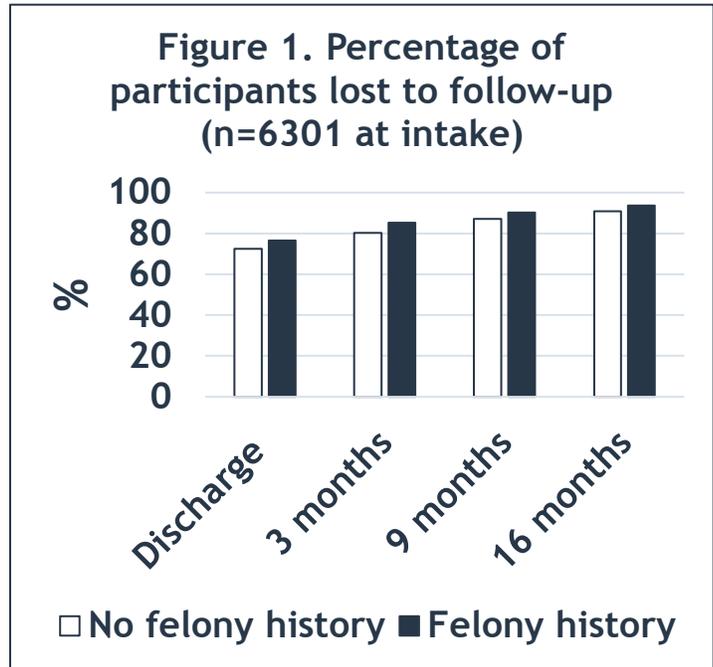
"successfully" (OR, 2.42, 1.56-3.76). There were no significant associations between felony history and improvement in PHQ-9, GAD-7, and SURE total score (Table 6).

What housing and treatment resources are accessed after discharge from IOP by people with a felony history?

Overall, a large percentage of participants who enrolled in the study were lost to follow-up at each time point (Fig. 1). However, those with a felony history were lost to follow-up more than those without a history (chi-squared tests at each time point were significant). The percentages of participants who were receiving professional services for a substance use disorder at post-discharge follow-up time points were similar among those with a felony history and those without, and dropped and stayed below 50% by three month follow-up (chi-squared tests at each time point were non-significant) (Fig. 2). Similarly, housing status was broadly comparable between participants with a felony history and those without at follow-up time points (chi-squared tests were non-significant) with a decrease in those living in recovery housing and an increase in those living at a permanent address the more time had elapsed from IOP discharge (Fig. 3).

Figure 1. Percentage of participants lost to follow-up (n=6301 at intake)

□ No felony history ■ Felony history

Conclusions

Almost half (44.3%) of the present sample had a felony history, raising the importance of better understanding this group's experience in treatment and ways to best support it. Participants with a felony history were more likely to be male, older, non-white, less educated, court-ordered to treatment, use amphetamines, report a diagnosis of PTSD or ADD/ADHD, have more previous treatment attempts for substance use, and first use a substance at a younger age. Those who used alcohol and sedatives in the past year were less likely to report a felony history, as were those who had been in an inpatient, hospital, or detox setting relative to those not in any treatment prior to their IOP intake.

Figure 2. Percentage of participants receiving professional services for a substance use disorder post-discharge from IOP

3 months (n=992) 9 months (n=727) 16 months (n=494)

□ No felony history ■ Felony history

Those with a felony history who enrolled in recovery housing during treatment were more likely than those who had not to discharge "successfully" from the IOP, and to have more sober days upon discharge. This is notable given that those with a felony history were less likely to enroll in recovery housing than those without a history. Enrollment in recovery housing for participants with a felony history did not appear to be associated with added improvement for depression and anxiety symptoms, or recovery capital.

Many people with a felony history were lost to follow-up in the present study (over 85% of participants who completed an intake survey did not complete a survey at 3 months),

Figure 3. Housing status by time point
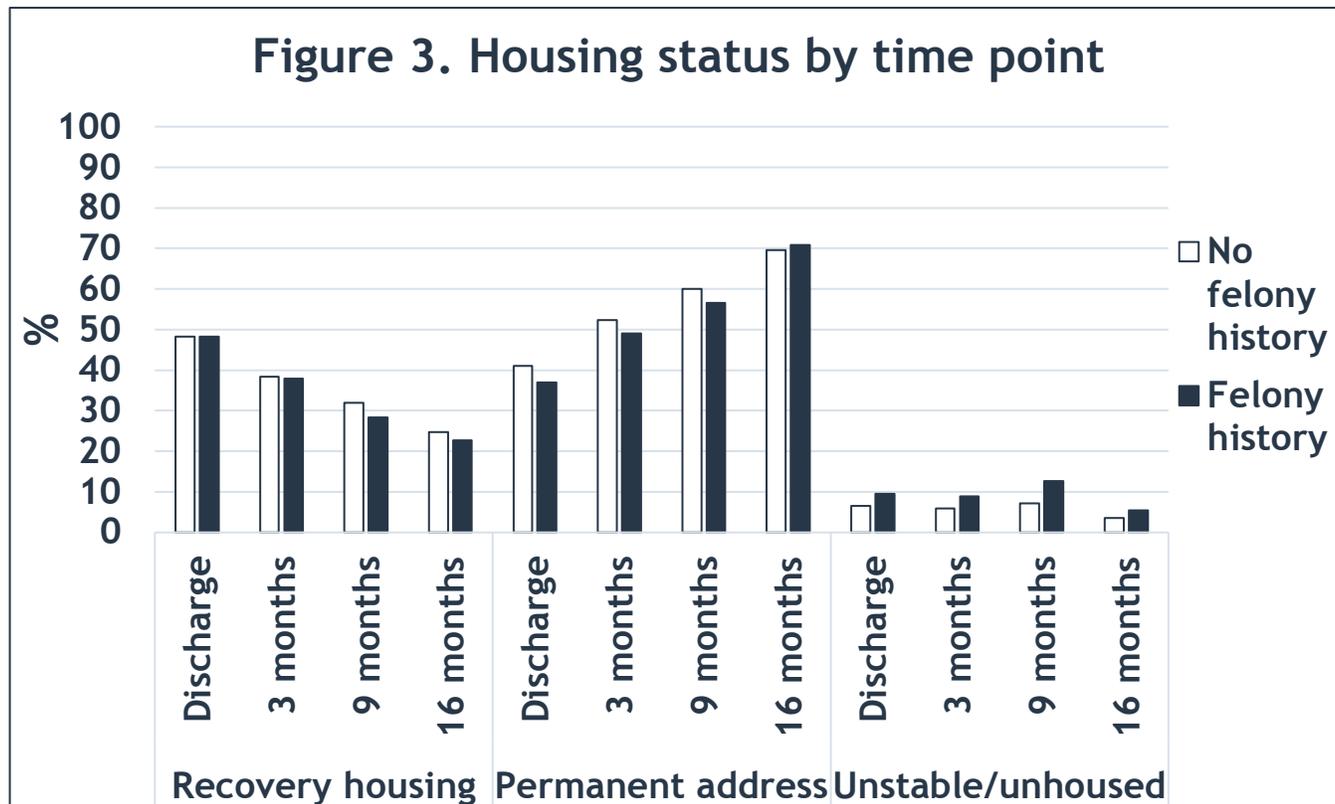
illustrating the need to further engage and support this population. Well below 50% of survey respondents with a felony history reported receiving professional services for a substance use disorder at three-month follow-up and beyond post IOP discharge. After IOP discharge, known respondents with a felony history shifted away from recovery housing and into permanent addresses. Nevertheless, close to 9% were unhoused/had unstable housing three months after discharge, and almost 13% at nine months post-discharge.

Although the present research brief is notable for including a large and somewhat diverse sample, several limitations should be acknowledged. First, the present brief used observational data, and thus inferences about causality should be tempered. Secondly, there was no way to determine how long prior to IOP treatment engagement a participant had been convicted of a felony, or how many convictions they had. Third, as mentioned above, there was significant loss to follow-up after the intake survey. Further research would benefit from examining outcomes of people with a felony history beyond IOP discharge.

Table 1. Associations between participant demographics and felony status participation (odds ratios and 95% CI)

Characteristic	Felony history		No felony history		Unadjusted			Adjusted		
Sex	N =1791		N =2233							
	n	%	*n*	%	OR	95% CI	*p*[a]	OR	95% CI	*p*[a]
Male	1343	75.0	1307	58.5	Ref					
Female	448	25.0	926	41.5	0.47	0.41-0.54	***	[b]0.45	0.35-0.57	***
Age	N =2410		N =3044							
35 years >	1161	48.2	1791	58.8	Ref					
35+ years	1249	51.8	1253	41.2	1.54	1.38-1.71	***	[c]2.16	1.77-2.64	***
Race	N =1772		N =2211							
White only	1053	59.4	1697	72.2	Ref					
Black only	347	19.6	244	11.0	2.16	1.80-2.59	***	[d]2.65	2.10-3.36	***
Amer. Indian/Alaska Native only	134	7.6	92	4.2	2.21	1.68-2.91	***	2.04	1.46-2.84	***
Asian only	28	1.6	22	1.0	1.93	1.10-3.39	*	1.18	0.60-2.29	0.63
Other only	77	4.4	119	5.4	0.98	0.73-1.32	0.90	1.00	0.64-1.56	0.99
Multiracial	133	7.5	137	6.2	1.47	1.15-1.89	**	1.43	1.05-1.94	*
Ethnicity	N =1676		N =2074							
Not Hispanic/Latinx	1568	93.6	1938	93.4	Ref					
Hispanic/Latinx	108	6.4	136	6.6	0.98	0.76-1.27	0.88			
Education	N =2793		N =3501							
Some H.S.	531	19.0	494	14.1	Ref					
H.S. diploma	1123	40.2	952	27.2	1.10	0.95-1.28	0.22	[e]1.09	0.83-1.44	0.53
Some college	805	28.8	1176	33.6	0.64	0.55-0.74	***	0.72	0.54-0.96	*
Associate or technical degree	236	8.5	407	11.6	0.54	0.44-0.66	***	0.58	0.38-0.87	**
Bachelors	63	2.3	347	9.9	0.17	0.13-0.23	***	0.28	0.16-0.50	***
At least some graduate school	35	1.3	125	3.6	0.26	0.18-0.39	***	0.35	0.17-0.74	**

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for race, education, court ordered to treatment, age of first substance use, cannabis use, depression diagnosis(dx), anxiety dx, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, eating dx, personality dx, treatment setting prior to intake, PHQ-9 score, and GAD-7 score

[c]Adjusted for race, ethnicity, education, cannabis use, alcohol use, opioid use, cocaine use, sedative use, anxiety dx, ADD/ADHD dx, eating dx, unhoused in the past 6 months, court ordered to treatment, # of prior substance use treatment attempts, and sober days.

[d]Adjusted for sex, education, ethnicity, cannabis use, alcohol use, amphetamine use, cocaine use, sedative use, treatment setting prior to intake, anxiety dx, bipolar dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, unhoused in past 6 months, court ordered to treatment, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and SURE total score.

[e]Adjusted for age, sex, race, ethnicity, cannabis use, alcohol use, amphetamine use, sedative use, treatment setting prior to intake, schizophrenia/schizoaffective dx, ADD/ADHD dx, unhoused in past 6 months, court ordered to treatment, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and sober days.

Table 2. Associations between participant substance use characteristics and felony history (odds ratios and 95% CI)

Characteristic		Felony history		No felony history		Unadjusted			Adjusted		
Age of first substance use		N =2788		N =3487							
		n	%	*n*	%	OR	95% CI	*p*[a]	OR	95% CI	*p*[a]
	15>	1521	54.6	1493	42.8	Ref					
	15+	1267	45.4	1994	57.2	0.62	0.56-0.69	***	[b]0.67	0.50-0.92	*
# of prior SUD treatment attempts		N =2793		N =3501							
	0	152	5.5	451	12.9	Ref					
	1-3	1034	37.0	1688	48.2	1.82	1.49-2.22	***	[c]1.87	0.98-3.57	0.06
	4+	1607	57.5	1362	38.9	3.50	2.87-4.27	***	3.43	1.79-6.57	***
Past year substances used		N =2793		N =3501							
Cannabis											
	No	1625	58.2	2085	59.5	Ref					
	Yes	1168	41.8	1416	40.5	1.06	0.96-1.17	0.27			
Alcohol											
	No	1753	63.8	1339	38.3	Ref					
	Yes	1040	37.2	2162	61.8	0.37	0.33-0.41	***	[d]0.55	0.44-0.68	***
Opioids											
	No	1943	69.6	2672	76.3	Ref					
	Yes	850	30.4	829	23.7	1.41	1.26-1.58	***	[e]1.08	0.90-1.30	0.43
Amphetamines											
	No	1009	36.1	2161	61.7	Ref					
	Yes	1784	63.9	1340	38.3	2.85	2.57-3.16	***	[f]1.96	1.59-2.43	***
Cocaine											
	No	2435	87.2	3080	88.0	Ref					
	Yes	358	12.8	421	12.0	1.08	0.93-1.25	0.34			
Sedatives											
	No	2654	95.0	3249	92.8	Ref					
	Yes	139	5.0	252	7.2	0.68	0.55-0.84	***	[g]0.56	0.41-0.77	***
Treatment setting prior to intake		N =2793		N =3501							
	None	467	16.7	542	15.5	Ref					
	Inpatient, hospital setting, detox	1806	64.7	2467	70.5	0.85	0.74-0.98	*	[h]0.75	0.56-0.98	*
	Other outpatient	351	12.6	357	10.2	1.14	0.94-1.38	0.18	1.18	0.84-1.67	0.33
	Other	169	6.1	135	3.9	1.45	1.12-1.88	**	1.17	0.71-1.92	0.54

Days sober from a substance		N =1650		N =2080							
<42 days (42 = 50th percentile)	750	45.5	1105	53.1	Ref						
42 or more days	900	54.5	975	46.9	1.43	1.20-1.69	***	[i]1.18	0.96-1.45	0.11	

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for age, sex, race, education, cannabis use, opioid use, amphetamine use, cocaine use, sedative use, depression dx, anxiety dx, bipolar dx, PTSD dx, ADD/ADHD dx, personality dx, unhoused in the past 6 months, felony hx, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

[c]Adjusted for age, sex, race, ethnicity, education, cannabis use, opioid use, amphetamine use, treatment setting prior to intake, depression dx, anxiety dx, bipolar dx, PTSD dx, ADD/ADHD dx, eating dx, personality dx, unhoused in the past 6 months, felony hx, age of first substance use, PHQ-9 score, GAD-7 score, and sober days.

[d]Adjusted for age, race, education, opioid use, amphetamine use, sedative use, depression dx, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, personality dx, unhoused in the past 6 months, court ordered to treatment, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and sober days.

[e]Adjusted for age, race, education, cannabis use, alcohol use, amphetamine use, cocaine use, sedative use, anxiety dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, unhoused in the past 6 months, treatment setting prior to intake, # of prior substance use treatment attempts, GAD-7 score, and SURE total score.

[f]Adjusted for race, education, alcohol use, opioid use, cocaine use, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, eating dx, personality dx, unhoused in the past 6 months, court ordered to treatment, age of first substance use, # of prior substance use treatment attempts, and sober days.

[g]Adjusted for age, race, education, alcohol use, opioid use, cocaine use, anxiety dx, PTSD dx, ADD/ADHD dx, eating dx, personality dx, unhoused in the past 6 months, court ordered to treatment, age of first substance use, PHQ-9 score, and GAD-7 score.

[h]Adjusted for sex, race, education, cannabis use, opioid use, amphetamine use, sedative use, depression dx, anxiety dx, PTSD dx, ADD/ADHD dx, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

[i]Adjusted for age, race, ethnicity, education, cannabis use, alcohol use, opioid use, amphetamine use, sedative use, depression dx, anxiety dx, PTSD dx, ADD/ADHD dx, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

Table 3. Associations between participant housing, legal, and psychiatric characteristics and felony history (odds ratios and 95% CI)										
Characteristic	Felony history		No felony history		Unadjusted			Adjusted		
Unhoused in past 6 months	N =2793		N =3501							
	n	%	*n*	%	OR	95% CI	*p*ᵃ	OR	95% CI	*p*ᵃ
No	1241	44.4	1929	55.1	Ref					
Yes	1552	55.6	1572	44.9	1.54	1.39-1.70	***	ᵇ1.15	0.95-1.35	0.15
Court ordered to treatment	N =2793		N =3501							
No	1410	77.7	284	65.1	Ref					
Yes	405	22.3	152	34.9	2.95	2.32-3.75	***	ᶜ2.69	2.17-3.33	***
Psychiatric diagnostic category	N =2523		N =3218							
Depressive disorder										
No	988	39.2	1042	32.4	Ref					
Yes	1535	60.8	2176	67.6	0.74	0.67-0.83	***	ᵈ0.96	0.77-1.21	0.75
Anxiety disorder										
No	821	32.5	891	27.7	Ref					
Yes	1702	67.5	2327	72.3	0.79	0.71-0.89	***	ᵉ0.80	0.63-1.01	0.06
Bipolar disorder										
No	2038	80.8	2630	81.7	Ref					
Yes	485	19.2	588	18.3	1.06	0.93-1.22	0.36			
Posttraumatic stress disorder										
No	1301	51.6	1923	59.8	Ref					
Yes	1222	48.4	1295	40.2	1.40	1.26-1.55	***	ᶠ1.55	1.26-1.91	***
Schizophrenia/Schizoaffective										
No	2346	93.0	3066	95.3	Ref					
Yes	177	7.0	152	4.7	1.52	1.22-1.90	***	ᵍ0.98	0.66-1.48	0.94
ADHD/ADD										
No	1670	66.2	2343	72.8	Ref					
Yes	853	33.8	875	27.2	1.37	1.22-1.53	***	ʰ1.31	1.09-1.57	**
Eating disorder										
No	2462	97.6	3064	95.2	Ref					
Yes	61	2.4	154	4.8	0.49	0.37-0.67	***	ⁱ0.88	0.60-1.28	0.53
Personality disorder										
No	2224	88.2	2916	90.6	Ref					
Yes	299	11.8	302	9.4	1.30	1.10-1.54	**	ʲ1.17	0.86-1.59	0.31

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for age, race, education, alcohol use, opioid use, amphetamine use, sedative use, depression dx, anxiety dx, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, personality dx, treatment setting prior to intake, court ordered to treatment, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

[c]Adjusted for age, sex, race, ethnicity, education, alcohol use, cannabis use, amphetamine use, cocaine use, sedative use, depression dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, treatment setting prior to intake, unhoused in the past 6 months, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

[d]Adjusted for sex, education, alcohol use, cocaine use, anxiety dx, bipolar dx, ADD/ADHD dx, PTSD dx, eating dx, personality dx, court ordered to treatment, treatment setting prior to intake, # of prior substance use treatment attempts, age of first substance use, unhoused in the past 6 months, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

[e]Adjusted for sex, age, race, opioid use, sedative use, depression dx, bipolar dx, ADD/ADHD dx, PTSD dx, eating dx, personality dx, treatment setting prior to intake, # of prior substance use treatment attempts, age of first substance use, unhoused in the past 6 months, PHQ-9 score, GAD-7 score, and sober days.

[f]Adjusted for sex, race, education, cannabis use, alcohol use, opioid use, amphetamine use, cocaine use, sedative use, depression dx, anxiety dx, bipolar dx, ADD/ADHD dx, eating dx, personality dx, treatment setting prior to intake, # of prior substance use treatment attempts, age of first substance use, unhoused in the past 6 months, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

[g]Adjusted for age, sex, race, education, cannabis use, alcohol use, opioid use, amphetamine use, cocaine use, bipolar dx, personality dx, unhoused in the past 6 months, court ordered to treatment, PHQ-9 score, GAD-7 score, and sober days.

[h]Adjusted for age, sex, race, education, cannabis use, alcohol use, opioid use, amphetamine use, sedative use, depression dx, anxiety dx, bipolar dx, eating dx, personality dx, unhoused in the past 6 months, court ordered to treatment, treatment setting prior to intake, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, and GAD-7 score.

[i]Adjusted for age, sex, amphetamine use, sedative use, depression dx, anxiety dx, bipolar dx, personality dx, treatment setting prior to intake, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and SURE total score.

[j]Adjusted for sex, cannabis use, alcohol use, amphetamine use, sedative use, depression dx, anxiety dx, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, eating dx, # of prior substance use treatment attempts, age of first substance use, unhoused in past 6 months, PHQ-9 score, GAD-7 score, and sober days.

Table 4. Associations between self-reported measures and felony history (odds ratios and 95% CI)

Measure	Felony history		No felony history		Unadjusted			Adjusted		
PHQ-9 Depression severity	N =2664		N =3294							
	n	%	*n*	%	OR	95% CI	*p*[a]	OR	95% CI	*p*[a]
None to mild (<10)	1938	72.2	2192	66.6	Ref					
Moderate or worse (≥10)	726	27.3	1102	33.4	0.77	0.66-0.90	**	[b]0.78	0.59-1.03	0.08
GAD-7 Anxiety severity	N =2789		N =3501							
None to mild (<10)	1929	69.2	2253	64.4	Ref					
Moderate or worse (≥10)	860	30.8	1248	35.6	0.88	0.76-1.02	0.09			
SURE total score (scale of 21-63)	N =2791		N =3501							
21-45	498	17.8	697	19.9	Ref					
46-63	2294	82.2	2801	80.1	1.16	0.97-1.39	0.10			

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for sex, race, cannabis use, alcohol use, opioid use, cocaine use, sedative use, depression dx, anxiety dx, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, eating dx, personality dx, unhoused in past 6 months, treatment setting prior to intake, court ordered to treatment, age of first substance use, # of prior substance use treatment attempts, GAD-7 score, SURE total score, and sober days.

Table 5. Associations between recovery housing participation and felony history (odds ratios and 95% CI)

Characteristic	Recovery housing		Self-housed		Unadjusted			Adjusted		
Felony history	N =1815		N =436							
	n	%	*n*	%	OR	95% CI	*p*[a]	OR	95% CI	*p*[a]
No	1108	61.1	242	55.5	Ref					
Yes	707	38.9	194	45.5	0.80	0.65-0.98	*	[b]0.52	0.35-0.77	**

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for age, sex, race, education, alcohol use, opioid use, amphetamine use, sedative use, treatment setting prior to intake, depression dx, anxiety dx, PTSD dx, ADD/ADHD dx, schizophrenia/schizoaffective dx, eating dx, personality dx, unhoused in the last 6 months, court ordered to treatment, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, SURE total score, and sober days.

Table 6. Associations between felony history, housing status, and change in PHQ-9, GAD-7, and SURE total scores from intake to discharge (odds ratios, 95% CI)

Characteristic	PHQ-9 (any improvement in score vs. no improvement)			GAD-7 (any improvement in score vs. no improvement)			SURE Total (any improvement in score vs. no improvement)		
	OR[b]	95% CI	p[a]	OR[b]	95% CI	p[a]	OR[b]	95% CI	p[a]
Felony history and housing status									
Felony history, no recovery housing	Ref			Ref			Ref		
No felony history, no recovery housing	1.61	0.83-3.12	0.16	1.31	0.68-2.52	0.42	1.17	0.60-2.26	0.65
Felony history, recovery housing	1.39	0.80-2.42	0.25	1.04	0.60-1.80	0.88	1.02	0.59-1.78	0.93
No felony history, recovery housing	1.60	0.91-2.82	0.11	1.40	0.80-2.45	0.24	1.36	0.77-2.40	0.29

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for age, sex, race, education, age of first substance use, # of prior substance use treatment attempts, treatment setting prior to intake, court ordered to treatment, alcohol use, amphetamine use, sedative use, PTSD dx, and ADD/ADHD dx.

Table 7. Associations between felony history, housing status, and sober days, discharge status from intake to discharge (odds ratios, 95% CI)

Characteristic	Days sober from a substance (>138 days vs. <139 days)			Discharge status (successful vs. unsuccessful)		
	OR[b]	95% CI	p[a]	OR[b]	95% CI	p[a]
Felony history and housing status						
Felony history, no recovery housing	Ref			Ref		
No felony history, no recovery housing	0.62	0.28-1.41	0.26	1.02	0.60-1.73	0.95
Felony history, recovery housing	1.96	1.02-3.78	*	2.42	1.56-3.76	***
No felony history, recovery housing	2.50	1.28-4.88	**	2.42	1.56-3.78	***

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for age, sex, race, education, age of first substance use, # of prior substance use treatment attempts, treatment setting prior to intake, court ordered to treatment, alcohol use, amphetamine use, sedative use, PTSD dx, and ADD/ADHD dx.

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HOUSING PROFILES AMONG PARTICIPANTS ATTENDING AN INTENSIVE OUTPATIENT PROGRAM FOR CO-OCCURRING DISORDERS

Michael Van Wert, MPH, MSW, LICSW, Emily Gus, MPH

Abstract
Housing stability is an important correlate of recovery status and well-being. The present research brief sought to describe participant housing profiles among a sample of 6301 people receiving intensive outpatient services (IOP) for co-occurring substance use and mental health challenges and examine any relationship between these profiles and treatment outcomes. About half of participants remained in the housing situation where they started at intake (31.9% stay in a recovery residence, 18.1% stay in a permanent address, 2.3% stay without a permanent residence or unhoused, and 0.5% stay in some other housing situation). Of the other half who changed housing during treatment, the most common shifts were moving from a recovery residence to a permanent residence (16.5%), from no permanent address/unhoused to a recovery residence (6.8%), and from a permanent address to a recovery residence. Notably, just under 6% of participants moved from potentially more stable housing to having no permanent address/being unhoused. Those who started treatment at a permanent address and moved to a recovery residence by discharge were more likely than those who remained in a recovery residence throughout treatment to report improvement in depression, anxiety, and recovery capital scores. Moreover, moving away from a recovery residence during treatment (compared to staying in one throughout) was associated with a decreased likelihood of improved recovery capital, "successful" discharge, and higher sober days at discharge. Housing changes may be an important client variable to consider when understanding treatment outcomes.

Background
Housing stability significantly correlates with quality of life and recovery status (Nesse, et al., 2020). Individuals residing in stable housing environments are less prone to engaging in emergency services or encountering law enforcement interactions (Kerman, et al., 2018). Environments characterized by housing stability, such as recovery housing, afford individuals the opportunity to concentrate on their recovery journey and increase access to essential social support services (Kerman, et al., 2018).

Research on housing status underscores that housing stability is not a one-dimensional measure. Existing literature endeavors to delineate housing stability and quality through various factors, including meeting basic needs, quality, affordability, permanence, autonomy and independence, connectedness, safety, and supportiveness (Yuan, et al., 2023; Frederick, et al., 2014).

To better understand the impact of housing stability on clients participating in an intensive outpatient program (IOP), this evaluation formulated housing profiles based on reported housing types upon admission and discharge. It aimed to discern any relationship between the housing profiles and outcomes of the IOP treatment.

The present brief sought to answer the following questions:
1) What are the housing profiles of participants who attend the IOP from admission to discharge?
2) How are housing profiles related to IOP treatment outcomes from admission to discharge?

Methods

Clients (n=6301) receiving intensive outpatient (IOP) services at NUWAY® were given the option to enroll in the study at the time of their admission. Electronic surveys were completed at intake and discharge, and then at three, nine and sixteen months after discharge. Surveys included demographic questions and outcome-related questions. Identifying information was removed for analysis to protect the privacy of participants.

Statistical Analysis:

To examine the associations between outcomes and housing profiles, logistic regression models were used (odds ratios and 95% confidence intervals were calculated and significance was set at $p<0.05$). Outcomes were all binary and included PHQ-9 (Kroenke, Spitzer & Williams, 2001) score improvement from admission to discharge (any vs. no improvement), GAD-7 (Spitzer at al., 2006) score improvement (any vs. no improvement), SURE (Neale et al., 2016) improvement (any vs. no improvement), discharge status ("successful" (with staff approval) vs. "unsuccessful" (against staff approval, transfer elsewhere, incarcerated, death)), and days sober from a substance at discharge (less than 139 days (median at discharge) vs. 139 days or more). Logistic regression analyses controlled for age (years), gender identity (cis woman, cis man, and transgendered/non-binary), and race (white only vs. non-white only). The term "unstable" was used in tables as short-hand to designate participants who did not have a permanent address or were unhoused. Regression analyses used housing profiles which had the most participants.

Results

What are the housing profiles of participants who attend the IOP from admission to discharge?

Over half (51.1%) of participants in the study were already living in a recovery residence prior to starting their IOP admission (Table 1). It is likely that many in this this group of participants had a scheduled admission to an IOP program. The next largest group is those who were living with other people at a permanent residence (19.0%). Of note, 12.0% of the sample were not living at a permanent address or were unhoused. The most common housing profile in the sample was participants who were living in a recovery residence at intake as well as at discharge (31.9%), followed by those living at a permanent residence at both intake and discharge (18.1%), those who started in a recovery residence and moved to a permanent address by discharge (16.5%), and those without a permanent address/unhoused at intake and in a recovery residence at discharge (6.8%). See Table 2 for a list of housing profiles.

Table 1: Housing status before IOP admission (N= 6301)			
	N	**% of total sample**	**% of known sample**
Housing before IOP admission			
Recovery residence	3217	51.1	55.5
Living with others in permanent address	1197	19.0	20.7
No permanent address/unhoused	753	12.0	13.0
Living alone in permanent address	423	6.7	7.3
Other	202	3.2	3.5
Unknown	509	8.1	

Table 2: Housing profiles from IOP admission to discharge (N = 1506)			
Housing profile		**N**	**% of known sample**
IOP intake	**IOP discharge**		
Recovery residence	Recovery residence	481	31.9
Permanent address	Permanent address	273	18.1
Recovery residence	Permanent address	249	16.5
No permanent address/unhoused	Recovery residence	102	6.8
Permanent address	Recovery residence	100	6.6
Recovery residence	No permanent address/unhoused	60	4.0
No permanent address/unhoused	Permanent address	54	3.6
Recovery residence	Other	40	2.7
No permanent address/unhoused	No permanent address/unhoused	34	2.3
Other	Recovery residence	30	2.0
Other	Permanent address	30	2.0
Permanent address	Other	17	1.1
Permanent address	No permanent address/unhoused	16	1.1
No permanent address/unhoused	Other	7	0.5
Other	Other	7	0.5
Other	No permanent address/unhoused	6	0.4

How are housing profiles related to treatment outcomes?

Participants who lived at a permanent address upon intake and moved to a recovery residence by discharge were more likely than those who started in a recovery residence and ended in a recovery residence to improve their PHQ-9 depression (OR: 2.69, CI: 1.27-5.71) and GAD-7 anxiety (OR: 2.12, CI: 1.04-4.35) scores during their treatment engagement length (Tables 3 and 4). Those who started in a recovery residence and moved into a residential situation other than a permanent address or unstable housing were less likely than those who remained in recovery housing during the whole IOP treatment engagement to improve in their depression (OR: 0.30, CI: 0.12-0.74) and anxiety (OR: 0.31, CI: 0.13-0.78) scores.

Participants who moved away from a recovery residence by the end of their IOP treatment engagement (to a permanent address (OR: 0.56, CI: 0.37-0.84), unstable housing (OR: 0.40, CI: 0.19-0.83), or to other housing (OR: 0.20, CI: 0.08-0.51)) were less likely than those who stayed in a recovery residence though discharge to report improved SURE total scores for recovery capital (Table 5). Consistent with this pattern, those who moved from a permanent

address to a recovery residence were more likely to report improved SURE scores (OR: 2.07, CI: 1.40-5.39). Although not significant, those who started in an unstable living situation and moved toward a permanent address or into recovery housing trended toward improved SURE scores.

Nearly all housing profiles were less likely to result in a "successful" discharge (e.g., with staff approval) than those who started and ended their IOP treatment engagement in a recovery residence (ORs ranged from 0.07 to 0.34) (Table 6). Similarly, nearly all profiles were less likely to have 139 days of sobriety or more upon discharge from the IOP (ORs ranged from 0.04 to 0.38) (Table 7).

Table 3. Associations between housing profiles and PHQ-9 improvement, admission to discharge (odds ratios and 95% CI, adjusted for age, gender identity, and race)

Admit and discharge housing	Improvement		No improvement		OR	95% CI	p
	N = 517		N = 410				
	n	%	n	%			
Recovery, recovery	187	36.2	153	37.3	Ref		
Permanent, permanent	110	21.3	75	18.3	1.21	0.81-1.81	0.36
Recovery, permanent	90	17.4	83	20.2	0.90	0.60-1.35	0.61
Unstable, recovery	36	7.0	21	5.1	1.11	0.57-2.18	0.76
Permanent, recovery	38	7.4	14	3.4	2.69	1.27-5.71	*
Recovery, unstable	16	3.1	21	5.1	0.68	0.33-1.40	0.29
Unstable, permanent	20	3.9	14	3.4	1.06	0.46-2.42	0.89
Recovery, other	9	1.7	19	4.6	0.30	0.12-0.74	**
Unstable, unstable	11	2.1	10	2.4	1.27	0.47-3.46	0.64

[a] *<0.05, **<0.01,***<0.001

Table 4. Associations between housing profiles and GAD-7 improvement, admission to discharge (odds ratios and 95% CI, adjusted for age, gender identity, and race)

Admit and discharge housing	Improvement		No improvement		OR	95% CI	p
	N = 509		N = 416				
	n	%	n	%			
Recovery, recovery	184	36.2	156	37.5	Ref		
Permanent, permanent	104	20.4	80	19.2	1.10	0.74-1.65	0.64
Recovery, permanent	92	18.1	81	19.5	0.84	0.56-1.26	0.40
Unstable, recovery	33	6.5	24	5.8	1.01	0.52-1.97	0.98
Permanent, recovery	35	6.9	17	4.1	2.12	1.04-4.35	*
Recovery, unstable	19	3.7	28	4.3	0.87	0.42-1.80	0.71
Unstable, permanent	20	3.9	14	3.4	1.04	0.46-2.38	0.93
Recovery, other	9	1.8	18	4.3	0.31	0.13-0.78	*
Unstable, unstable	13	2.6	8	1.9	1.27	0.46-3.46	0.65

[a] *<0.05, **<0.01,***<0.001

Table 5. Associations between housing profiles and SURE total score improvement, admission to discharge (odds ratios and 95% CI, adjusted for age, gender identity, and race)

Admit and discharge housing	Improvement		No improvement		OR	95% CI	p
	N = 563		N = 372				
	n	%	n	%			
Recovery, recovery	220	39.1	121	32.5	Ref		
Permanent, permanent	111	19.2	75	20.2	0.72	0.48-1.09	0.12
Recovery, permanent	92	16.3	85	22.9	0.56	0.37-0.84	**
Unstable, recovery	40	7.1	18	4.8	1.13	0.56-2.29	0.73
Permanent, recovery	41	7.3	12	3.2	2.40	1.07-5.39	*
Recovery, unstable	15	2.7	22	5.9	0.40	0.19-0.83	*
Unstable, permanent	26	4.6	8	2.5	1.64	0.63-4.25	0.31
Recovery, other	9	1.6	19	5.1	0.20	0.08-0.51	**
Unstable, unstable	9	1.6	12	3.2	0.47	0.17-1.26	0.65

[a] *<0.05, **<0.01,***<0.001

Table 6. Associations between housing profiles and discharge status (odds ratios and 95% CI, adjusted for age, gender identity, and race)

Admit and discharge housing	Successful		Unsuccessful		OR	95% CI	p
	N = 531		N = 411				
	n	%	n	%			
Recovery, recovery	251	47.3	89	21.7	Ref		
Permanent, permanent	93	17.5	96	23.4	0.34	0.22-0.52	***
Recovery, permanent	78	14.7	101	24.6	0.24	0.16-0.37	***
Unstable, recovery	42	7.9	16	3.9	0.71	0.35-1.43	0.33
Permanent, recovery	38	7.2	16	3.9	0.75	0.38-1.50	0.42
Recovery, unstable	6	1.1	32	7.8	0.07	0.03-0.17	***
Unstable, permanent	13	2.5	21	5.1	0.25	0.11-0.58	**
Recovery, other	6	1.1	23	5.6	0.08	0.03-0.33	***
Unstable, unstable	4	0.8	17	4.1	0.08	0.02-0.28	***

[a] *<0.05, **<0.01,***<0.001

Table 7. Associations between housing profiles and sober days at discharge (odds ratios and 95% CI, adjusted for age, gender identity, and race)

Admit and discharge housing	>138 days		<139 days		OR	95% CI	p
	N = 326		N = 309				
	n	%	n	%			
Recovery, recovery	185	56.8	75	24.3	Ref		
Permanent, permanent	39	12.0	90	29.1	0.15	0.09-0.26	***
Recovery, permanent	57	17.5	68	22.0	0.31	0.19-0.50	***
Unstable, recovery	10	3.1	9	2.9	0.38	0.14-1.08	0.07
Permanent, recovery	21	6.4	3	1.0	2.03	0.57-7.26	0.28
Recovery, unstable	6	1.8	21	6.8	0.07	0.02-0.22	***
Unstable, permanent	6	1.8	13	4.2	0.20	0.06-0.60	**
Recovery, other	0	1.1	19	6.2	--	--	--
Unstable, unstable	2	0.6	11	3.6	0.04	0.004-0.29	**

[a] *<0.05, **<0.01,***<0.001

Conclusions

Just over half of participants for whom there was available data from IOP intake to discharge remain in the housing situation where they started at intake (31.9% stay in a recovery residence, 18.1% stay in a permanent address, 2.3% stay without a permanent residence or unhoused, and 0.5% stay in some other housing situation). Of the other half who change housing during treatment, the most common shifts were moving from a recovery residence to a permanent residence (16.5%), from no permanent address/unhoused to a recovery residence (6.8%), and from a permanent address to a recovery residence. Notably, just under 6% of participants move from potentially more stable housing to having no permanent address/being unhoused.

Those who started treatment at a permanent address and moved to a recovery residence by discharge were more likely than those who remained in a recovery residence throughout treatment to report improvement in depression, anxiety, and recovery capital scores. The improvement in scores might be explained by the change in housing environment, assuming that moving to a recovery residence might reduce exposure to a stressful environment at permanent addresses and increase support offered by the recovery residence. Alternatively, participants' depression, anxiety, and recovery capital might improve due to factors such as IOP treatment, and this may lead them to seek out more support through a recovery residence to maintain well-being.

It appears that moving away from a recovery residence during treatment (compared to staying in one throughout), including moving back into a permanent address, is associated with a decreased likelihood of improved recovery capital, "successful" discharge, and higher sober days at discharge. Of note, staying in a permanent address throughout treatment engagement, as well as remaining without a permanent address/unhoused, are both associated with a lower likelihood of "successful" discharge and higher sober days on discharge. Moreover, those who moved from no permanent address/unhoused to a permanent address were less likely than

those who stayed in a recovery residence to discharge "successfully" and have higher sober days. These results highlight the potential role that consistent recovery housing might play in engaging and stabilizing people working toward recovery.

Although the present research brief is notable for including a large and somewhat diverse sample, several limitations should be acknowledged. First, the present brief used observational data, and thus inferences about causality should be tempered. Secondly, there was significant loss to follow-up after the intake survey, rendering sample sizes in some housing profiles small. Finally, outcome data analyses did not account for differences in sample characteristics. Further research would benefit from an increased sample size, as well as look at housing profiles beyond IOP admission to better understand how housing changes may impact outcomes longitudinally.

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THE SUBSTANCE USE RECOVERY EVALUATOR: A CLOSER LOOK AMONG ADULTS PRESENTING TO AN INTENSIVE OUTPATIENT PROGRAM FOR CO-OCCURRING DISORDERS

Michael Van Wert, MPH, MSW, LICSW, Emily Gus, MPH

Abstract

Numerous measures have been proposed to best measure recovery from substance use. The present research brief sought to examine the Substance Use Recovery Evaluator (SURE)'s reliability, validity, and descriptive associations with participant characteristics among a sample of 6301 people receiving intensive outpatient services (IOP) for co-occurring substance use and mental health challenges. SURE reliability ranged from "poor" to "excellent," with the material resources subscale having the former and the total score the latter. SURE domains were significantly negatively correlated with measures of psychopathology, such as the PHQ-9 and GAD-7, and positively correlated with sobriety, a related construct addressed in the SURE. Housing status was associated with SURE total score and the material resources subscale, with people having unstable housing/being unhoused being less likely to have a higher score on the SURE scales. Adjusting for confounders, those who were Black only (relative to White only) and those who had been unhoused in the past six months (relative to those who hadn't) were less likely to score a 56 or above on the SURE total scale, and those who had been in a treatment setting prior to IOP intake (relative to those who hadn't) were more likely to score 56 or above. Understanding the SURE's limitations and strengths in the present setting and population is key to making informed decisions about its use for clinical and research purposes.

Background

Historically, recovery from substance use disorders has been thought of as abstinence from substance use, or from a clinical perspective, no longer meeting criteria for a substance use disorder. This has expanded beyond remission from use to encompass other areas including quality of life, coping ability, physical health, employment, environmental health, and social connectedness (Bjornestad et al., 2020), and there has been an emphasis on recovery as an ongoing *process*, rather than a discrete change.

Given that the recovery process is likely a complex and individualized one, the literature has raised concerns about how to best measure this process systematically. Okrant, Reif, & Horgan (2023) identified eight validated measures of recovery, and highlight questions about their generalizability, heterogeneity of domains across existing measures, and lack of comprehensiveness. One of these measures is the Substance Use Recovery Evaluator (SURE), a 21-item psychometrically-tested self-reported measure (Neale et al., 2016), developed with input from people in recovery. The SURE measure uses Likert style responses and requires participants to respond using their experiences over the last week. It measures several domains: drinking and drug use, self-care, relationships, material resources, outlook on life, and recovery importance. Although the SURE is credited for actively incorporating stakeholder voices into its development and has been used in various studies of people using substances

(Lintzeris et al., 2021), the measure would likely benefit from further lessons learned through use with large and diverse samples.

The present brief sought to examine the SURE's reliability, validity, and descriptive associations with participant characteristics based on a large sample of adults receiving treatment for co-occurring disorders in an intensive outpatient program.

Methods

Clients (n=6301) receiving intensive outpatient (IOP) services at NUWAY® were given the option to enroll in the study at the time of their admission. Electronic surveys were completed at intake and discharge, and then at three, nine and sixteen months after discharge. Surveys included demographic questions and outcome-related questions. Identifying information was removed for analysis to protect the privacy of participants.

Statistical Analysis:

To examine associations between SURE scores and other potentially related measures, such as the PHQ-9 (Kroenke, Spitzer & Williams, 2001), GAD-7 (Spitzer at al., 2006), and days sober from substances, spearman correlations were calculated (p<0.05, Bonferroni corrected). Cronbach's alpha was used to examine SURE scale reliability. Logistic regression models were used to explore associations between SURE total score and participant characteristics (odds ratios and 95% confidence intervals, p<0.05). Due to violations in assumptions of normality and equal variance, SURE data was transformed into binary categorical form with cutoffs set at the median for each of the SURE total and subscales. For associations between SURE scores and participant characteristics, regression analyses were first unadjusted. Then, where there were statistically significant relationships in unadjusted models, adjusted multiple logistic regression models were used to examine the relationship between the participant characteristic and SURE score while accounting for possible confounding variables. For each characteristic that had a significant unadjusted association, confounding variables were selected if there was a significant association between the characteristic and the variable as measured by chi-square tests of independence (p<0.05). Unless otherwise specified, data presented and analyzed was collected at the time of participants' intake to the IOP program.

Results

Overall summary statistics

In the present sample, SURE scores tended to be skewed toward the upper boundaries of the scales (Figure 1): total score (median=56, IQR=12; mean=53.2, SD=8.8), drinking and drug use (median=17, IQR=3; mean=16.1, SD=2.7), self-care (median=13, IQR=5; mean=12.2, SD=3.1), relationships (median=12, IQR=1; mean=11.1, SD=1.8), material resources (median=7, IQR=4; mean=6.6, SD=1.9), and outlook on life (median=9, IQR=3; mean=7.3, SD=2.1).

Reliability

Cronbach's alpha coefficient was excellent for the SURE total score (*alpha*=0.90), acceptable for the drinking and drug use subscale (*alpha*=0.77), good for the self-care subscale (*alpha*=0.85), good for the relationships subscale (*alpha*=0.82), poor for the material resources subscale, and good for the outlook on life subscale (*alpha*=0.87).

Validity

The SURE total score was negatively correlated with both PHQ-9 (rho=-0.65) and GAD-7 (rho=-0.54) scores indicating that higher recovery scores are associated with lower levels of depression and anxiety severity (Table 1). Conceptually, this makes sense given that all the subscales of the SURE are likely impacted by depression and anxiety symptoms (e.g., worse self-care and outlook on life are associated with more severe symptoms). Indeed, there are negative correlations between the PHQ-9 and GAD-7 scores and all the SURE subscales. Notably, days sober is not particularly strongly correlated with the SURE drinking and drug use subscale (rho=0.40), and its magnitude is about the same as that of the SURE total score (rho=0.37).

Figure 1: SURE score summary information (line indicates median score, upper and lower boundaries of gray region indicate interquartile range)
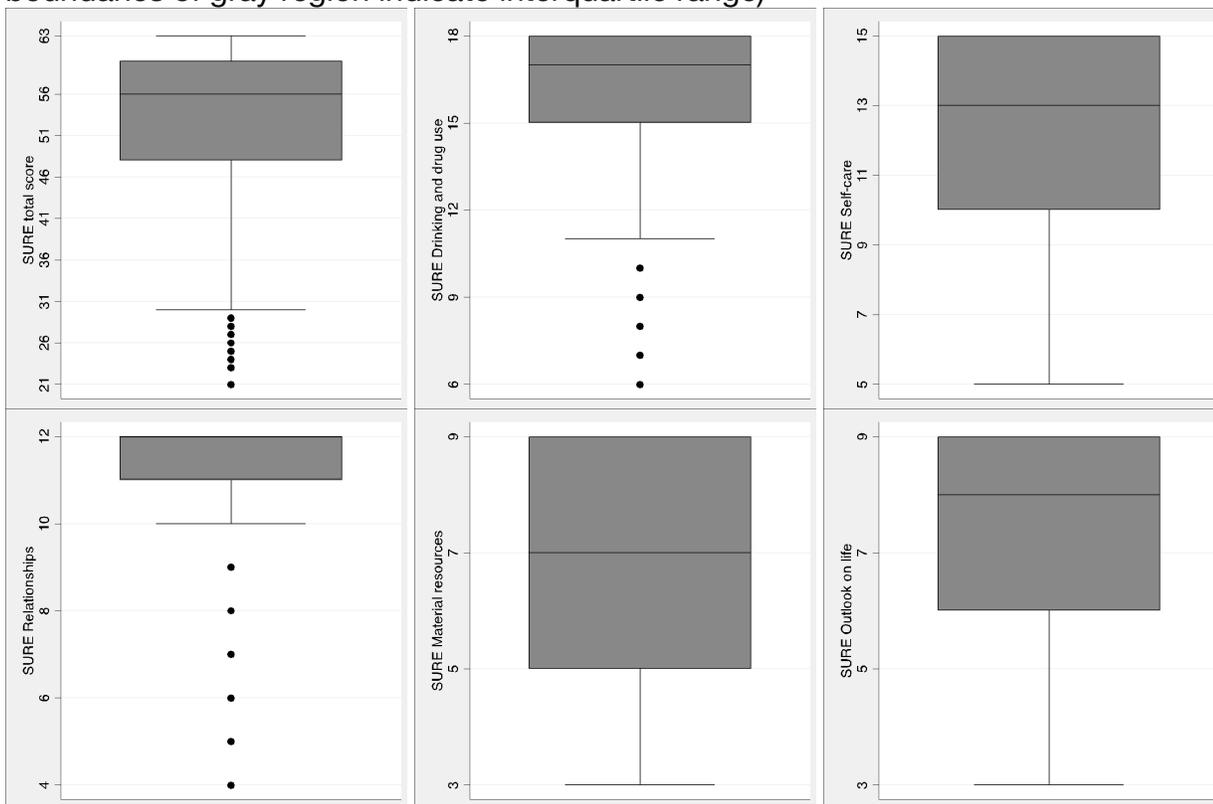
Relative to participants who reported having unstable housing/being unhoused at the time of intake, those who reported living in a recovery residence (OR, 2.60, 2.20-3.06), a permanent residence alone or with someone else (OR, 2.74, 2.29-3.28), or some other living situation (OR, 1.96, 1.43-2.68) were more likely to score a 7 (out of 9) or above on the material resources subscale. Of note, those living in a recovery residence (OR, 2.99, 2.53-3.54), a permanent residence (OR, 1.64, 1.37-1.97), or other living situation (OR, 2.04, 1.49-2.79) were also more likely to score 56 (out of 63) or above on the total scale. Moreover, upon discharge from the IOP, participants who reported working full-time (OR, 1.85, 1.07-3.20)

were more likely to score a 7 (out of 9) or above on the material resources subscale compared to those who were not working.

Table 1. Spearman correlations between PHQ-9, GAD-7, SURE total, SURE subscales, and sober days at intake (all correlations are significant at p<0.05, Bonferroni corrected)								
Measure	Days sober	PHQ-9	GAD-7	SURE total	SURE drinking/ drugs	SURE self-care	SURE relationships	SURE material resources
Days sober								
PHQ-9	-0.25							
GAD-7	-0.19	0.80						
SURE total	0.37	-0.65	-0.54					
SURE drinking/drugs	0.40	-0.41	-0.33	0.70				
SURE self-care	0.29	-0.61	-0.49	0.83	0.49			
SURE relationships	0.25	-0.45	-0.37	0.67	0.40	0.55		
SURE material resources	0.17	-0.33	-0.28	0.64	0.29	0.39	0.35	
SURE outlook	0.30	-0.60	-0.51	0.78	0.44	0.61	0.55	0.41

Associations with sample characteristics

Adjusting for possible confounding characteristics, participants who were Black only were less likely to score 56 (out of 63) or above on the SURE total score compared to those who were White only (OR, 0.70, 0.52-0.96) (Table 2), and those who had been unhoused in the past six months were less likely than those who had not (OR, 0.69, 0.56-0.85) (Table 4). Moreover, those who had been in an inpatient/hospital/detox setting (OR, 3.05, 2.23-4.17) or other outpatient setting (OR, 1.73, 1.15-2.59) were more likely to score 56 or above relative to those who had not been in any treatment setting (Table 3).

Conclusions

The present research brief had the benefit of examining the SURE with a large and robust sample of participants to consider its reliability, validity, and utility. In the present sample, SURE total scores and subscale scores tended to be relatively high. One might argue that these scores might seem to be higher than expected, for example, with the drinking and drug use subscale, given that participants were presenting to an IOP, an acute level of care, for issues related to substance use and mental health symptoms. On the other hand, perhaps many had scored high because they had already enrolled in recovery-oriented supports, including recovery housing, by the time they had presented to their IOP intake. Moreover, many had discharged from an inpatient/hospital setting, which may have stabilized participants significantly and accounted for higher scores. Centrally tending high scores on the SURE may present some challenges to statistical modeling in using it as a measure of outcome change (note: this may have more to do with the present sample, and not the SURE itself). More nuanced normative data at different levels of care (e.g., inpatient, outpatient, IOP) would be beneficial.

SURE reliability ranged from "poor" to "excellent," with the material resources subscale having the former and the total score, the latter. As one might expect if the SURE was accurately measuring some overall domain of recovery capital or well-being, its domains were significantly negatively correlated with measures of psychopathology, such as the PHQ-9 and GAD-7, and positively correlated with sobriety, a related construct addressed in the SURE. Of

note, housing status was associated with SURE total score and the material resources subscale, with people having unstable housing/being unhoused being less likely to have a higher score on the SURE scales.

Adjusting for a range of possible participant characteristic confounders in the present sample, those who were Black only (relative to White only) and those who had been unhoused in the past six months (relative to those who hadn't) were less likely to score a 56 or above on the SURE total scale, and those who had been in a treatment setting prior to IOP intake (relative to those who hadn't) were more likely to score 56 or above. Given the available data on racial and ethnic inequities in health driven by systemic forces, such as racism, perhaps the difference in SURE score among Black and White participants in the present sample is not surprising, particularly since the SURE incorporates various social determinants of health and their impact in its questions. Similarly, one might expect people with less stable housing to score lower on the SURE, which asks directly about stable housing. Finally, the higher scores among those who had been in formal treatment prior to their intake might reflect the potential benefits of structured treatment to recovery.

A few limitations of the present brief should be acknowledged. First, it used observational data, and thus inferences about causality should be tempered. Secondly, median cutoff scores used in the present analyses to delineate "higher" and "lower" scores may be idiosyncratic to the present sample and may occlude possible associations between the SURE and various demographics that might exist at different cutoffs.

Table 2. Associations between demographic characteristics and SURE total score (odds ratios, 95% CI)						
Characteristic		**Unadjusted**			**Adjusted**	
Sex						
	OR	**95% CI**	*p*[a]	**OR**	**95% CI**	*p*[a]
Male	Ref					
Female	1.12	0.99-1.28	0.08			
Age						
35 years >	Ref					
35+ years	1.03	0.93-1.15	0.55			
Race						
White only	Ref					
Black only	0.77	0.64-0.92 **		[b]0.70	0.52-0.96	*
Amer. Indian/Alaska Native only	1.27	0.96-1.67	0.09	0.77	0.47-1.26	0.30
Asian only	1.27	0.72-2.24	0.41	0.72	0.31-1.70	0.45
Other only	0.94	0.70-1.26	0.67	1.41	0.78-2.57	0.26
Multiracial	0.95	0.74-1.22	0.78	1.24	0.80-1.91	0.33
Ethnicity						
Not Hispanic/Latinx	Ref					
Hispanic/Latinx	0.89	0.69-1.16	0.38			
Education						
Some H.S.	Ref					
H.S. diploma	1.12	0.96-1.30	0.14			
Some college	1.04	0.90-1.21	0.60			
Associate or technical degree	1.02	0.83-1.24	0.87			
Bachelors	0.91	0.73-1.15	0.44			
At least some graduate school	0.89	0.63-1.24	0.48			

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for sex, education, ethnicity, cannabis use, alcohol use, amphetamine use, cocaine use, sedative use, treatment setting prior to intake, anxiety dx, bipolar dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, unhoused in past 6 months, court ordered to treatment, felony history, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, and GAD-7 score.

Table 3. Associations between substance use characteristics and SURE total score (odds ratios, 95% CI)

Characteristic	Unadjusted			Adjusted		
Age of first substance use						
	OR	95% CI	p^a	OR	95% CI	p^a
15>	Ref					
15+	1.13	1.02-1.25	*	[b]1.15	0.93-1.41	0.20
# of prior SUD treatment attempts						
0	Ref					
1-3	1.07	0.90-1.28	0.44			
4+	1.08	0.91-1.29	0.38			
Past year substances used						
Cannabis						
No	Ref					
Yes	0.82	0.74-0.91	***	[c]0.83	0.67-1.04	0.11
Alcohol						
No	Ref					
Yes	0.86	0.78-0.95	**	[d]1.10	0.86-1.42	0.46
Opioids						
No	Ref					
Yes	0.88	0.79-0.99	*	[e]0.90	0.74-1.10	0.32
Amphetamines						
No	Ref					
Yes	1.22	1.10-1.34	***	[f]1.17	0.96-1.42	0.13
Cocaine						
No	Ref					
Yes	0.74	0.63-0.86	***	[g]0.83	0.64-1.07	0.16
Sedatives						
No	Ref					
Yes	0.81	0.66-0.99	*	[h]1.10	0.78-1.56	0.58
Treatment setting prior to intake						
None	Ref					
Inpatient, hospital setting, detox	3.69	3.18-4.29	***	[i]3.05	2.23-4.17	***

Other outpatient	1.83	1.50-2.24	***	1.73	1.15-2.59	**
Other	1.52	1.16-1.99	**	1.07	0.60-1.89	0.82

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for age, sex, race, education, cannabis use, opioid use, amphetamine use, cocaine use, sedative use, depression dx, anxiety dx, bipolar dx, PTSD dx, ADD/ADHD dx, personality dx, unhoused in the past 6 months, felony hx, PHQ-9 score, GAD-7 score, and sober days.

[c]Adjusted for age, sex, race, ethnicity, education, opioid use, sedative use, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, personality dx, court ordered to treatment, treatment setting prior to intake, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, and sober days.

[d]Adjusted for age, race, education, opioid use, amphetamine use, sedative use, depression dx, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, personality dx, unhoused in the past 6 months, court ordered to treatment, felony hx, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and sober days.

[e]Adjusted for age, race, education, cannabis use, alcohol use, amphetamine use, cocaine use, sedative use, anxiety dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, unhoused in the past 6 months, felony hx, treatment setting prior to intake, # of prior substance use treatment attempts, and GAD-7 score.

[f]Adjusted for race, education, alcohol use, opioid use, cocaine use, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, eating dx, personality dx, unhoused in the past 6 months, court ordered to treatment, felony hx, age of first substance use, # of prior substance use treatment attempts, and sober days.

[g]Adjusted for age, race, education, opioid use, sedative use, depression dx, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, court ordered to treatment, age of first substance use, treatment setting prior to intake, PHQ-9 score, and GAD-7 score.

[h]Adjusted for age, race, education, alcohol use, opioid use, cocaine use, anxiety dx, PTSD dx, ADD/ADHD dx, eating dx, personality dx, unhoused in the past 6 months, court ordered to treatment, age of first substance use, PHQ-9 score, and GAD-7 score.

[i]Adjusted for sex, race, education, cannabis use, opioid use, amphetamine use, sedative use, depression dx, anxiety dx, PTSD dx, ADD/ADHD dx, felony hx, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and sober days.

Table 4. Associations between housing, legal, and psychiatric characteristics and SURE total score (odds ratios, 95% CI)

Characteristic	Unadjusted			Adjusted		
Unhoused in past 6 months						
	OR	95% CI	p^a	OR	95% CI	p^a
No	Ref					
Yes	0.76	0.69-0.84	***	[b]0.69	0.56-0.85	**
Court ordered to treatment						
No	Ref					
Yes	1.26	1.13-1.41	***	[c]1.12	0.88-1.44	0.36
Convicted of a felony						
No	Ref					
Yes	1.22	1.11-1.35	***	[d]1.14	0.90-1.45	0.28
Psychiatric diagnostic category						
Depressive disorder						
No	Ref					
Yes	0.69	0.62-0.77	***	[e]1.14	0.88-1.47	0.32
Anxiety disorder						
No	Ref					
Yes	0.82	0.73-0.92	**	[f]1.05	0.79-1.38	0.76
Bipolar disorder						
No	Ref					
Yes	0.77	0.67-0.88	***	[g]1.03	0.83-1.28	0.80
Posttraumatic stress disorder						
No	Ref					
Yes	0.81	0.73-0.90	***	[h]1.23	0.97-1.54	0.08
Schizophrenia/Schizoaffective						
No	Ref					
Yes	1.01	0.81-2.27	0.91			
ADHD/ADD						
No	Ref					
Yes	0.89	0.79-0.99	*	[i]1.21	0.99-1.47	0.05
Eating disorder						
No	Ref					

Yes	0.58	0.44-0.77	***	[j]1.26	0.81-1.95	0.31
Personality disorder						
No	Ref					
Yes	0.71	0.59-0.84	***	[k]0.84	0.59-1.20	0.34

[a] *<0.05, **<0.01,***<0.001

[b]Adjusted for age, race, education, alcohol use, opioid use, amphetamine use, sedative use, treatment setting prior to intake, depression dx, anxiety dx, bipolar dx, PTSD dx, ADD/ADHD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, personality dx, court ordered to treatment, felony hx, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and sober days.

[c]Adjusted for age, sex, race, ethnicity, education, cannabis use, alcohol use, amphetamine use, cocaine use, sedative use, treatment setting prior to intake, depression dx, ADD/ADHD dx, schizophrenia/schizoaffective dx, unhoused in the last 6 months, felony hx, PHQ-9 score, GAD-7 score, and sober days.

[d]Adjusted for age, sex, race, education, alcohol use, opioid use, amphetamine use, sedative use, treatment setting prior to intake, depression dx, anxiety dx, PTSD dx, ADD/ADHD dx, schizophrenia/schizoaffective dx, eating dx, personality dx, unhoused in the last 6 months, court ordered to treatment, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, GAD-7 score, and sober days.

[e]Adjusted for sex, education, alcohol use, cocaine use, anxiety dx, bipolar dx, ADD/ADHD dx, PTSD dx, eating dx, personality dx, court ordered to treatment, treatment setting prior to intake, # of prior substance use treatment attempts, age of first substance use, unhoused in the past 6 months, PHQ-9 score, GAD-7 score, and sober days.

[f]Adjusted for sex, age, race, opioid use, sedative use, depression dx, bipolar dx, ADD/ADHD dx, PTSD dx, eating dx, personality dx, treatment setting prior to intake, # of prior substance use treatment attempts, age of first substance use, felony hx, unhoused in the past 6 months, PHQ-9 score, GAD-7 score, and sober days.

[g]Adjusted for sex, race, education, alcohol use, cannabis use, depression dx, anxiety dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, PTSD dx, eating dx, personality dx, # of prior substance use treatment attempts, age of first substance use, unhoused in the past 6 months, PHQ-9 score, and GAD-7 score.

[h]Adjusted for sex, race, education, cannabis use, alcohol use, opioid use, amphetamine use, cocaine use, sedative use, depression dx, anxiety dx, bipolar dx, ADD/ADHD dx, eating dx, personality dx, treatment setting prior to intake, # of prior substance use treatment attempts, age of first substance use, felony hx, unhoused in the past 6 months, PHQ-9 score, GAD-7 score, and sober days.

[i]Adjusted for age, sex, race, education, cannabis use, alcohol use, opioid use, amphetamine use, sedative use, depression dx, anxiety dx, bipolar dx, eating dx, personality dx, unhoused in the past 6 months, court ordered to treatment, felony hx, treatment setting prior to intake, age of first substance use, # of prior substance use treatment attempts, PHQ-9 score, and GAD-7 score.

[j]Adjusted for age, sex, amphetamine use, sedative use, depression dx, anxiety dx, bipolar dx, personality dx, treatment setting prior to intake, # of prior substance use treatment attempts, PHQ-9 score, and GAD-7 score.

[k]Adjusted for sex, cannabis use, alcohol use, amphetamine use, sedative use, depression dx, anxiety dx, bipolar dx, PTSD dx, schizophrenia/schizoaffective dx, ADD/ADHD dx, eating dx, # of prior substance use treatment attempts, age of first substance use, unhoused in past 6 months, felony hx, PHQ-9 score, GAD-7 score, and sober days.

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