Reentry Service Engagement Among a Reentry Population with Co-occurring Mental Health and Opioid Use Disorders in Massachusetts Jails

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Abstract: *Aim:* Co-occurring opioid use and mental health disorders (COD) are common among people with criminal legal involvement. Reentry is a vulnerable period with low treatment engagement, often resulting in relapse, reincarceration, and overdose. While both linkage and multicomponent COD wraparound interventions have supported reentry, little is known about which are most effective for treatment engagement post release.

Methods: This quasi-experimental study included 293 nonrandomized persons involved in the criminal legal system enrolled in a multicomponent COD intervention (n=173) or a linkage only model (n=120) for treatment. Kaplan Meier Curves and Cox Proportional Hazards were computed to determine differences in engagement.

Results: Engagement was significantly different between interventions (X^2=58.33, *P* <.0001). We observed a 73.3% reduction in hazard of early discharge for participants receiving the multicomponent COD intervention as compared to the linkage only model (*P*<.0001) and a higher 12-month engagement rate (51.5%) compared to the linkage only model (20.8%).

Conclusions: Future research should include a randomized controlled trial to examine factors that influence post-release engagement as well as treatment effects and outcomes. We suggest that programs consider both interventions and assess client reentry needs in advance of release to match to the best suited post-release COD treatment.

Keywords: Reentry, Co-occurring integrated disorders treatment, Criminal justice, Addiction, Substance use disorders, Mental health.

INTRODUCTION

An estimated 10.3 million people in the United States (U.S.), aged 12 and older, misuse opioids [1].Twenty-five percent of people with an opioid use disorder (OUD) pass through the criminal legal system annually [2], and about 50% of this population has one or more co-occurring mental health and substance use disorders (COD) [3]. Compared to those with OUD only, those with COD are more susceptible to substance use relapses, [4] and high reincarceration rates [5]. The transition from jail to the community is a period of increased risk that includes a three-to-eight-fold increased opioid overdose risk within two weeks of release [6] and up to a 57% risk of fatal overdose within the first year [6-9]. Thus, support for reentry is critical during this vulnerable period from jail to the community [7, 10-17]. Unfortunately, low engagement in behavioral health and community services post-release is a common phenomenon with rates as low as low 33% [18-23].

In an effort to improve engagement in post-release treatment, jails have implemented a variety of reentry services across the U.S. [24]. Successful reentry support often includes in-reach where outside staff offer pre-release planning as well as post-release coordination of care that often includes either community linkage models or wraparound treatment models. Besides varying when to intervene, the types of services can range from linkage support (*i.e.*, where staff offer in reach and outreach), but focus on referrals to community agencies to deliver more traditional wraparound support where providers take on a more active role to support peoples' recovery. Linkage models have been used commonly in non-criminal legal settings, such as behavioral health and medical settings to help patients navigate complex health and social service systems [25-30]. These efforts increase access to care, reduce service fragmentation, and improve outcomes [25-29]. More recently these efforts have begun being used in the criminal-legal sysytem, and demonostrate high initial linkage to community treatement, but low engagement in care, and few intervention effects on behavioral health and criminal justice outcomes [30-34].

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Given the complexity of COD compared to people with only OUD in reentry settings, multicomponent wraparound interventions for COD have begun to gain popularity. Multicomponent interventions have combined integrated dual disorders treatment along with assertive community outreach [35-38]. Maintaining Independence and Sobriety through Systems Integration, Outreach and Networking-Criminal Justice (MISSION-CJ) [39-41] is another example that integrates six evidence-based care components as discussed below. Multicomponent wraparound interventions, including MISSION-CJ, have demonstrate efficacy for promoting treatment engagement, reducing service fragmentation, providing linkages and warm handoffs for clients with diverse needs to community services, improving behavioral health outcomes, and improving criminal legal outcomes [42-46].

While both linkage and multicomponent wraparound models have been used with reentry populations with COD, little is known about which model offers favorable engagement in care post-release. This study addresses this strategic gap by comparing client engagement between two types of reentry interventions: (1) a multicomponent COD wraparound treatment intervention (MISSION-CJ); and (2) a linkage only model (Recovery Support Navigation, RSN). Although both interventions intend to bridge the gap between release from jail and community reintegration, we hypothesize that the multicomponent wraparound intervention will yield higher rates of program engagement because this approach is inherently a more comprehensive approach that can address the multitude of disparate needs for people with COD [47].

METHODS

Data for this research comes from a Substance Abuse and Mental Health Services Administration (SAMHSA) Opioid State Targeted Response (O-STR) grant awarded to the Massachusetts Department of Public Health, Bureau of Substance Addiction Services (MDPH/BSAS). O-STR provided funds to support the prevention and treatment of opioid use disorder, which included the Medication Assisted Treatment-Reentry Initiative (MAT-RI) in Massachusetts. MAT-RI specifically aimed to reduce criminal legal recidivism, increase access to treatment and recovery support services, and reduce unmet treatment needs as well as opioid use and overdose rates during the transition from incarceration to community reintegration. MAT-RI aimed to provide up to 12 months of post-release services. MISSION-CJ and RSN staff administered baseline assessments to MAT-RI participants within

two weeks of release from jail and collected weekly service tracking data. Baseline and service tracking data were part of a larger treatment outcome study that has yet to be reported.

Study Design and Procedures

This study included a program evaluation of a non-randomized quasi-experimental study (deterministically assigned by location as predetermined by MDPH/BSAS) to examine the preliminary effectiveness of integrating a multicomponent COD wraparound treatment model (MISSION-CJ) as a comprehensive treatment option as compared to a linkage only model (RSN) for individuals with COD releasing from jail. Of note, this design was selected as SAMHSA does not allow randomized control trials (RCT), and O-STR dollars were intended to provide direct services in the state of Massachusetts. Thus, this study reports on findings from the MAT-RI program evaluation.

MAT-RI services were implemented across 6 jails in Massachusetts with geographic variability (*e.g.*, urban, suburban, and rural settings), and each modality offered 12 months of post-release services. Referrals were recommended by jail staff at each site, and MISSION-CJ/RSN staff conducted further participant screening with the following criteria: (1) 18 years or older; (2) met DSM-5 [48] criteria for OUD/and or had a history of opioid overdose; (3) had a co-occurring mental health disorder(s); and (4) consented to participate in services. Exclusion criteria included: (1) individuals that were either acutely psychotic or had a severe psychiatric condition in need of immediate treatment; (2) were acutely suicidal; or (3) needed immediate medical attention related to substance use (*i.e.*, withdrawal conditions). Of note, throughout the duration of this project, no individuals were excluded for these three criteria. Once clients provided consent to treatment and evaluation, they were then enrolled in MAT-RI. At this time, in-reach pre-release rapport building, and post-release planning commenced, and study data collection began within two weeks post-release. This study was reviewed by the Massachusetts Department of Public Health Institutional Review Boards (IRB). The IRB deemed this study to be program evaluation rather than human subjects research.

Interventions

RSN is a linkage model (a non-manualized approached) which offers both in-reach and post-release support via a paraprofessional navigator (bachelor's level without lived experience). RSN services commenced during pre-release to build

rapport (up to 6 months before release) and the RSN navigator worked with each individual to develop a set of goals and objectives to guide linkages to treatment and recovery support activities and linkage support continued for 12 months post-release. RSN navigators typically carry caseloads of up to 35 clients. Linkages often include treatment for mental health, addiction, physical health needs, legal support, and other benefits. Navigators are not responsible for an individual's comprehensive care plan, clinical service delivery, ongoing care communication with other clinical teams, or care coordination [49].

MISSION-CJ is the multicomponent COD wraparound treatment model being tested [50]. It integrates six evidence-based interventions to meet the broad social determinants of health (SDOH) needs of individuals involved in the criminal legal system with COD exiting jail. MISSION-CJ offered a 'time-limited' wraparound team-based approach jointly delivered by a case manager and a peer support specialist (*i.e.*, an individual with lived addiction and mental health recovery, as well as criminal legal experience), with caseloads of approximately 18 clients per team. MISSION-CJ provided up to 6 months of in-reach, and the post-release component of the MISSION-CJ curriculum includes 3-4 hours per week of individual and/or group sessions in the first 4 months of the program, then tapers to 2 hours of individual and/or group sessions every other week starting in month 5 for the duration of treatment. Staff provided services in the community and the participant's home. MISSION-CJ systematically incorporates six evidence-based treatment components in the service delivery model. The first component, Critical Time Intervention (CTI) Case Management [51],offers intensive community-based services to help the client establish firm linkages to behavioral health and other prosocial supports in the community via assertive outreach, care coordination, and collaborative treatment planning (delivered both by the case manager and peer support specialist). The second treatment component, DRT [38] is delivered by the case manager and includes thirteen structured sessions provided in the first 3 months of MISSION-CJ programming (followed by booster sessions as needed), for participants to develop skills and to address mental health and substance use symptoms simultaneously in addition to other problematic behaviors. The third treatment component is Peer Support [52] which includes both unstructured community visits as well as eleven structured recovery-based sessions (*e.g.*, a session reinforcing the importance of medication and maintaining a medication schedule in the recovery process). These sessions are offered by the peer support specialist to complement

DRT delivered by the case manager, and they are designed to facilitate and support recovery in the community. The fourth component of MISSION-CJ is vocational and educational support, which includes assessing clients' needs and assisting them in finding and maintaining employment as well as achieving educational goals. The fifth component of MISSION-CJ is trauma-informed care. Although MISSION-CJ is not a Post-Traumatic Stress Disorder Treatment intervention, MISSION-CJ teams are trained to understand, recognize, and respond to the effects of trauma in order to then refer and link clients to other treatment providers who offer evidence-based trauma treatment. The sixth component of MISSION-CJ addresses dynamic criminogenic risks and responsivity factors affecting treatment engagement. This component includes cognitive-behavioral exercises to address criminogenic thinking and behavior, assertive outreach by peers and case managers to help clients engage in prosocial activities and relationships, and intervention delivery tailored toward client characteristics affecting treatment engagement [53]. MISSION-CJ is listed in the Substance Abuse and Mental Health Service Administration, National Registry of Evidence Based Programs and Practices [54] and in a recent publication by the National Association of Mental Health Program Directors Research Institute [55] More information on the MISSION-CJ components and sessions can be found in the MISSION-CJ Treatment Manual [56].

Study Population

293 MAT-RI clients enrolled in a nonrandomized quasi experimental study (deterministically assigned by location), in which they either received a COD wraparound intervention (n=173) or a linkage only model (n=120). Clients were enrolled in programming pre-release to engage and build rapport, and baseline assessments were completed within two weeks of release into the community. All services were provided in person.

Measures

Self-reported data collected at baseline (within 2 weeks of release from jail) included history of criminal legal involvement, alcohol and illicit substance use, and other behavioral health and social issues. The baseline assessment was a compilation of instruments including: (1) the SAMHSA Government Performance and Results Act questions (GPRA) [57], (2) the Addiction Severity Index (ASI), which includes domains regarding demographics, substance use and criminal legal involvement; and (3) behavioral health symptoms

were measured via the Behavior and Symptom Identification Scale-32 (BASIS-32). The BASIS-32 includes 32 items which are rated on a scale of 0 to 4, where 4 indicates extreme difficulty and 0 indicates no difficulty, and it is comprised of five subscales: Depression and Anxiety, Psychosis, Relation to Self and Others, Impulsive and Addictive Behavior, and Daily Living and Role Functioning [58]. Engagement in care was tracked via weekly service tracking logs.

Statistical Analysis

To determine necessary covariates in models, univariate and bivariate statistics were computed (chi-square test of independence for nominal data and independent t-tests for continuous data). To examine the unadjusted distribution of engagement over time, we plotted a Kaplan-Meier survival curve [59] for each intervention. To predict duration of engagement, we modeled survival analysis by using discrete-time survival analysis methods (Cox Proportional Hazards). We define engagement in care as: the duration of receiving active (*i.e.*, weekly contact) care spanning from the date of release until the last date of service. Survival analysis is a technique for studying time to an event. However, because duration cannot be modeled directly, hazard or risk of an event of interest over time (*e.g.*, treatment discontinuation in this case), which is a mathematical transformation of duration, is usually modeled (60). All analyses were conducted in SAS version 9.2 [61]. For survival analysis, we excluded 6 cases due to incomplete data [thus our sample for this portion is n=287). Of note, we selected several variables *a priori* (*e.g.*, gender) for the model despite the absence of statistical significance in bivariate analyses, given that literature indicates differential treatment engagement rates [62, 63]. All other covariates were determined based on significant differences from bivariate analyses. If any covariates had a multicollinearity variance inflation factor (VIF] value above 5, they were removed from the final model [64]. All survival analysis statistics are included below in the results, and in tables and figures (Kaplan-Meier results in Table **2** and Figure **2**; and Cox Proportional Hazards in Table **4**).

RESULTS

Univariate Results

Among the 293 participants, 173 (59%) received MISSION-CJ services, and 120 (41%) received RSN services. Among the 293 participants, 73% were male, 68% White, 17% Black/African American, 15% were other races, 23% were Hispanic/Latino, and on average 38 years of age. On average, clients had 23

lifetime arrests, reported illicit substance use for an average of 16 years, and alcohol use for 11 years. 41% of the sample reported receipt of medication for opioid use disorder (MOUD) while receiving MAT-RI services. On average, clients reported the following substance use in the past 6 months: 8 days of opioid use, 6 days of crack/cocaine use, 6 days of marijuana use, and 5 days of alcohol use. Regarding mental health, the average baseline total BASIS-32 score [58] was 0.57, and of note, the BASIS-32 five subscales ranged from 0.71 for the Relation to Self & Others, 0.86 for Depression & Anxiety, 0.40 for the Impulsive/Addictive Behaviors, and 0.18 for Psychosis. In the past 6 months, clients reported an average of 2 arrests, 143 nights spent in jail, and 11 crimes committed. Over clients' lifetimes, the sample reported an average of 23 arrests, over 5 years of lifetime incarceration (61.4 months) and the average age of first arrest was 18. All univariate statistics are included below in Table **1**.

Bivariate Results

Bivariate analyses between clients receiving MISSION-CJ versus RSN services were computed and several statistically significant differences were observed. Differences include: (1) age; (2) race/ethnicity; (3) years of homelessness; (4) lifetimes arrests; (5) lifetime incarceration ; (6) lifetime nights spent in jail; (7) lifetime alcohol use; (8) history of treatment utilization for alcohol use; (9) BASIS-32 impulsive and addictive behavior scores; (10) BASIS-32 total scores; (11) days of illicit drugs use in the last 6 months; (12) most problematic substance; (13) proportion receiving MOUD; (14) and housing status. We did not observe any statistically significant difference between MISSION-CJ and RSN regarding gender, average prerelease days, average age of first arrest, lifetime heroin use, lifetime crack/cocaine use, crimes committed in the last 6 months, average age of first use of an illicit substance, lifetime homelessness, or the depression and anxiety, impulsive and addictive, and daily living BASIS -32 scores (All *Ps* > .05). All bivariate statistics are included below in Table **1**.

Survival Analysis Results

As noted above, our key outcome was treatment engagement post-release. MISSION-CJ participants were engaged longer than RSN participants (*Mdn*=288 days versus *Mdn*=150 days respectively, t= 8.113, *P* <.0001, see Figure **1**). Kaplan Meier Curves were compared for each treatment intervention (*i.e.*, unadjusted statistical test). The test of equality over strata indicated that engagement was significantly different between interventions (likelihood ratio

Table 1:   Baseline Characteristics: RSN, MISSION-CJ and Overall Sample

	RSN *(n=120)*	MISSION-CJ *(n=173)*	Overall *(n=273)*	*p*
Age (SD)				
Years	39 (8.5)	41(9.6)	38(9.2)	*.029**
Gender				*.108*
Male	67%	77%	73%	
Female	33%	23%	27%	
Race				
Black/African American	21%	11%	17%	*.044**
White	65%	73%	68%	*.304*
Other	14%	16%	15%	*.835*
Ethnicity				*.000****
Hispanic/Latino	30%	17%	23%	
Criminal Legal Involvement (Lifetime) (SD)	98.50%			
Lifetime arrests	17 (17.0)	27 (35.7)	23 (29.7)	*.000****
Lifetime incarceration, months	63 (78.2)	59 (63.9)	61 (72.7)	*.000****
Average Prerelease days	53 (49.6)	61(70.0)	57 (59.3)	*.215*
Average Age of First Arrest	19 (16.9)	18 (11.9)	18 (14.1)	*.035*
Criminal Legal Involvement (6 Months) (SD)				*.446*
Average arrests	3 (19.9)	.59 (2.8)	2 (15.4)	
Average nights spent in jail	146 (59.8)	137 (55.3)	143 (58.0)	*.027**
Crimes committed	8 (30.3)	14 (33.6)	11 (31.8)	*.792*
Substance Use (Lifetime) (SD)				
Average lifetime years of alcohol use	9 (9.9)	13 (12.6)	11 (11.8)	*.006***
Average lifetime years of marijuana/hash use	11 (10.5)	10 (10.6)	11 (10.3)	*.012**
Average lifetime years of heroin use	16 (11.5)	11 (17.7)	7 (7.3)	*.962*
Average lifetime years of crack/cocaine use	8 (8.4)	7 (9.2)	7 (8.9)	*.289*
Average number of times clients have been treated for alcohol use disorder	1 (5.4)	5 (10.0)	3 (7.7)	*.467*
Average number of times clients have been treated for SUD	9 (12.5)	5 (13.2)	7 (14.0)	*.008***
Average lifetime illicit drug use (years)	16 (8.3)	16 (10.3)	16 (9.7)	*.40*
Average age illicit drug use for the first time	16 (5.5)	15 (4.6)	15 (5.0)	*.45*
Substance Use (6 Months) (SD)				
Average Illicit Drug use days	15 (34.9)	9 (28.3)	11 (31.3)	*.030**
Average Alcohol use days	5 (19.0)	6 (26.1)	5 (23.4)	*.018**
Average Opioid use days	12 (43.7)	6 (26.3)	8 (26.4)	*.449*
Average Crack/Cocaine use days	6 (22.0)	6 (24.2)	6 (23.3)	*.243*
Average Marijuana/Hash use days	7 (24.6)	5 (17.8)	6 (20.9)	*.260*
Most problematic substance				
Opioids	72%	47%	57%	*.001***
Alcohol	13%	24%	20%	*.026**
Crack/Cocaine	10%	22%	17%	*.007***
Marijuana	.8%	4%	3%	*.096*

Stimulants	2%	1%	.7%	.089
Sedatives	1%	1%	1%	.785
Hallucinagenics	.8%	.6%	.7%	.801
Post-Release Receipt of MOUD	60.8%	27.2%	41.1%	.001**
BASIS-32 score				
Total	.58	.55	.57	.012*
Relation to Self & Others	.72	.70	.71	.067
Depression and Anxiety	.84	.88	.86	.278
Impulsive & Addictive	.47	.30	.40	.012*
Psychosis	.19	.16	.18	.416
Daily Living	.69	.72	.71	.596
Housing				.000**
Stable	11%	13%	6%	
Unstable	89%	87%	94%	
Homelessness (SD)				
Lifetime (years)	3.0 (5.2)	4.4 (6.9)	3.9 (6.3)	.098

Note. p <.05*, p<.01**, p<001***

X^2=58.33, DF=1, P <.0001). RSN had a steeper decline in engagement compared to MISSION-CJ post-release as compared to MISSION-CJ (see Figure **2**), resulting in 12-month engagement rates of 51.5% for MISSION-CJ and 20.8% for RSN.

Table 3:   Results From T test of Equality Over Strata

Test	X^2
Long Rank	58.33***
Wilcoxon	57.63***
2Log (LR)	18.53***

Note. *p<.05, **p<.01, ***p<.001

Cox Proportional Hazards were computed to determine differences in length of engagement while controlling for individual level covariates at baseline. Cox proportional Hazards indicated a 73.3% reduction in hazard of early discharge for individuals receiving

MISSION-CJ as compared to RSN (P < .0001), controlling for all baseline covariates (*e.g.*, age, race/ethnicity, gender, number of arrests, length of criminal legal involvement, most problematic substance, length of pre-release engagement days, and whether clients were receiving any form of medication for opioid use disorder (MOUD) as a dichotomous measure). The difference between engagement for each intervention was not attenuated when baseline patient level factors were considered, which suggests that the effect of model type is significant regardless of client level differences.

DISCUSSION

To our knowledge, this study is the first to compare treatment engagement between a multicomponent COD wraparound treatment model to a linkage only model among a reentry population. Our findings reveal significantly higher engagement among participants

Table 2:   Engagement Rates Over Time by Intervention

Time frame	MISSION-CJ		RSN		Difference Between Interventions
	Rate	% Δ	Rate	% Δ	% Difference
3 Months	97.60%	2.46%	77.50%	29.03%	
6 Months	75.40%	29.44%	42.50%	82.35%	-64.25%
9 Months	51.50%	46.41%	21.70%	95.85%	-51.58%
12 Months	51.50%	0.00%	20.80%	4.33%	-100.00%

Table 4:   Cox Proportional Hazards Analysis

Type 3 Tests:	Wald X^2	SE	Parameter Estimate	Hazard Ratios
Effect Model	35.49***	0.22	-1.32	0.267
Age	2.59	0.01	-0.03	0.969
Gender	7.04**	0.22	0.59	1.811
Race	3.62	0.17	0.32	1.389
Ethnicity	.4118	0.33	-0.21	0.809
Length CJ Involvement	1.67	0.01	0.02	1.022
Number of Previous Arrests	.0383*	0.00	0.00	1.001
Most Problematic Substance	3.266	0.08	-0.15	0.856
Number of Prerelease days	3.14*	0.00	0.00	1.003
MOUD	7.67**	.21	-0.60	.547

Note. $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

who received MISSION-CJ compared to RSN. These findings lead us to reject our null hypothesis that there was no difference between engagement rates associated with the two models. We observed the evidence for this conclusion in three ways: (1) estimates for time to discontinuation revealed that MISSION-CJ had the largest hazard reduction (73.3%, $P < 0.0001$); (2) RSN had significantly higher treatment discontinuation early in treatment (*e.g.*, 22.5% discontinued during the first three months of care, versus 2.4% for MISSION-CJ); and (3) higher 12-month engagement rates among participants who received MISSION-CJ services (51.5%) compared to RSN (20.8%).
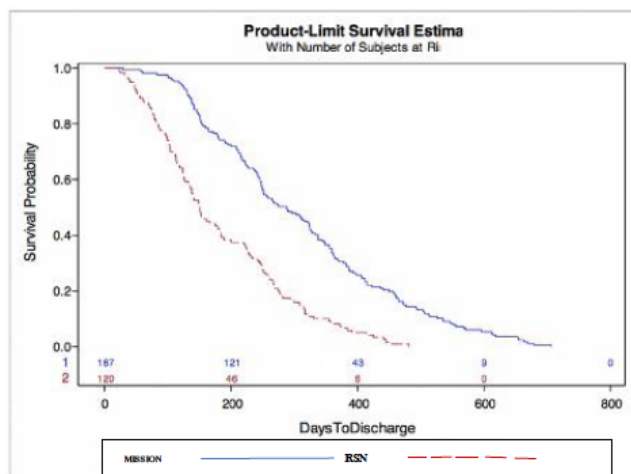
Figure 1: Kaplan-Meier Curve compared for each treatment intervention.

Reentry is a vulnerable transitional period [65] and numerous studies note that as a result of a lack of treatment engagement, outcome studies to promote positive reentry outcomes are lacking [66-68]. In the present study, RSN had a steeper decline in engagement compared to MISSION-CJ post-release at every observation point (*i.e.*, 0-3, 3-6, 6-9, 9-12 months) (see Figure **2**). However, engagement rates across both interventions levelled off between 9 and 12 months, resulting in 12-month engagement rates of 51.5% for MISSION-CJ and 20.8% for RSN. More research is needed to examine client-level factors that impact treatment responders and non-responders, and factors that influenced treatment discontinuation.
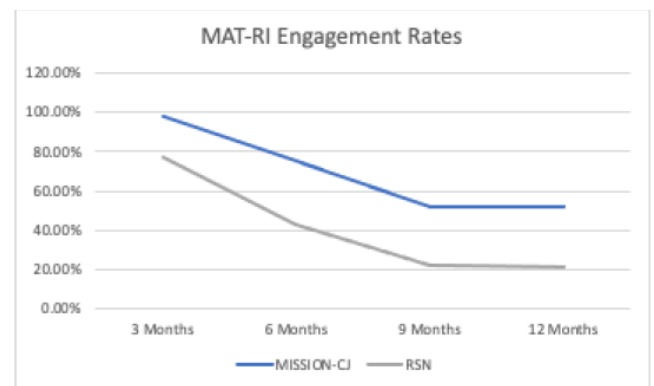

Figure 2: Engagement Rates by Model.

Another interesting finding is related to MOUD. Research has shown that MOUD (a) improves engagement in care, (b) improves behavioral health outcomes, and (c) reduces all-cause and overdose related mortality [69-75]. In the present study, findings from Cox Proportional Hazard Models were not attenuated by client level factors, including client's MOUD status. It is also worth noting that receipt of MOUD did have a significant hazard reduction (43%, $P = 0.0056$), although model type had a greater hazard

reduction (73.3%, *P* < 0.0001). This represents a 70.47% increase in hazard reduction when considering the effect of MOUD only on the model. This finding indicates that MOUD is an important predictor of treatment engagement, but it is not the only predictor. This observation is consistent with other research [76, 77], indicating that layered or multicomponent treatments can improve engagement in treatment and outcomes for people with COD [76]. For example, Gu *et al*. [78] conducted a randomized control trial and observed higher treatment retention rates among participants who received both MOUD and counseling compared to MOUD alone (*i.e*., 45% reduced likelihood of attrition for receiving both MOUD and counseling compared to only MOUD) [78]. Additionally, Hser *et al*. (2011) [79] randomized participants to MOUD + contingency management versus MOUD alone, and they reported that the combination of services improved overall engagement compared to receiving MOUD alone. Findings from other research and observations from the present study suggest that multicomponent or layered treatments (*e.g*., psychosocial treatment in addition to MOUD) for people with COD can improve engagement. Unfortunately, meta-analyses also indicate that there is a dearth of empirical research comparing different psychosocial approaches to offer in conjunction with MOUD. Consequently, we have insufficient knowledge about how to best layer treatment among vulnerable populations to best optimize care [76].

These findings are important because people with COD releasing from jail often have multiple behavioral health and other psychosocial needs that must be addressed during reentry services. The presence of both mental health and substance use diagnoses and accompanying complex needs have been linked to poor treatment outcomes [80-82]. In fact, federal reentry guidelines for incarcerated persons with co-occurring disorders [83] suggest that inadequate transition planning can increase the incidence of psychiatric symptoms, increase recidivism, and lower engagement rates [83]. We posit that MISSION-CJ might have achieved higher engagement rates compared to RSN because the intervention offered individuals with COD more comprehensive treatment and services via a multicomponent treatment intervention. Given the complexity of individuals with COD, a linkage only model might not cover all the needs of a person transitioning from a structured to an unstructured setting, such as during reentry. Nonetheless, we should also note that single component interventions have also been effective. For

example, CTI have demonstrated improvements for people with COD during reentry [42, 84]. Thus, clinicians and scientists alike should evaluate clients with fewer complex needs to determine whether single component interventions, such as linkage only, might be as effective as multicomponent for less complex cases. If single component interventions can be used effectively, there is an added benefit of being able to serve more clients with less severe COD given that the treatment is less costly. The present study, despite observing higher engagement among MISSION-CJ participants compared to RSN, advances the field by providing more information that can help the field to determine the impact of multidimensional versus unidimensional treatment on a variety of health outcomes.

Limitations and Future Considerations

Despite this preliminary evidence from this program evaluation that a multicomponent COD wraparound treatment intervention increases engagement among reentry populations with COD compared to a linkage only model, several limitations should be acknowledged. The most substantial limitation is the quasi-experimental and deterministic design, which does not include participant randomization since this was a program evaluation project funded by SAMHSA (who does not fund RCTs). However, findings from this program evaluation provide some suggested next steps for the field. Second, the data used for analyses was self-reported by participants, including substance use and criminal legal involvement (*e.g*., arrests and nights incarcerated), as opposed to official record data. However, it is noteworthy that self-report data is routine in program evaluations to judge the effectiveness of a service delivery model [85]. Third, a measure to confirm the mental health diagnosis from a clinician at each jail would have enhanced this study (*e.g*., the Structured Clinical Interview for DSM-5 (SCID-5-CV). Fourth, due to missing follow-up data, we could not control for completion status, or assess the behavioral health and criminal justice outcomes between models of care. However, the BASIS-32 is a well validated and reliable measure of mental health symptoms [86]. Fifth, this study was conducted before the implementation of the CARE Act in Massachusetts, which requires all jails to offer MOUD to persons with OUD. As a result, participants in this study had differential pre-release access to MOUD depending on their jail location. Sixth, these data were evaluated in isolation (although part of a larger evaluation yet to be reported), and as a result there may have been other new events such as overdose, death, substance use treatment, CJ

recidivism, emergency department (ED) utilization, or re-hospitalization not captured by the study's primary data collection. A next step in evaluating these findings would be to link to such data to account for new events such as these. Also, sensitivity analyses and causal inference methods are needed to determine what type of MISSION-CJ sessions (*e.g.*, structured vs. unstructured) and what components (*e.g.*, DRT, CTI, etc.) drive criminal legal and behavioral health improvements for participants with COD. Finally, given evidence that persons at higher risk of reoffending require more intervention to improve criminal justice related outcomes [87, 88], future research should include a RCT to compare treatment engagement among reentry programs by clients' risk level. A RCT would add considerably to the literature regarding what works to improve criminal legal involvement and for whom these treatments work.

Nonetheless, despite these limitations, a multicomponent COD wraparound treatment intervention is an effective approach to boost engagement among reentry populations with COD. However, a critical next step is to conduct a large, longitudinal RCT of MISSION-CJ versus a less intensive model (*e.g.*, a linkage only model). For example, a 3-arm randomized trial design (MOUD only, versus MOUD + MISSION-CJ, MOUD + RSN) would provide the ability to ascertain the additive effects of layered treatment approaches (*i.e.*, wraparound or linkage only model) in addition to MOUD for a population with co-occurring opioid use and mental health disorders. In addition, future studies should compare outcomes for participants who were matched to reentry COD services based on comprehensive COD, SDOH, and CJ risks and needs. Longitudinal studies will provide a clearer picture of the course of addiction and mental health, and prospective studies also hold the potential to affirm the potential causes of recovery among those clients with severe and chronic symptoms.

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DISCLOSURE

The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the University of Massachusetts, or the Massachusetts Department of Public Health Bureau of Substance Addiction Services, or the United States Government.

ETHICAL APPROVAL

The Massachusetts Department of Public Health's Institutional Review Board reviewed this pilot and determined it to be program evaluation rather than human subjects research.

RESEARCH INVOLVING HUMAN PARTICIPANTS

This article does not contain any studies with human participants performed by any of the authors.

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