Community Behavioral Health Service Use and Criminal Recidivism of People With Mental, Substance Use, and Co-occurring Disorders

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Objective: This study assessed the relationship between community behavioral health service (CBHS) use and criminal recidivism in a broad sample of potential beneficiaries and by diagnostic group.

Methods: Among a cohort of people on probation with any mental and/or substance use disorder (N=772), the study estimated the effect of CBHS use on rearrest with Cox proportional hazards models.

Results: Service use significantly predicted reduced recidivism among people with any mental disorder (hazard rate=0.36, p=0.008), but not among those with any substance use disorder or co-occurring disorders.

Conclusions: CBHS use in a given week predicted a 64% reduced recidivism risk during the following week among people with any mental disorder. However, CBHS use had no clear relationship with recidivism among people with co-occurring disorders or any substance use disorder. CBHS use may reduce recidivism, depending on recipient and service characteristics.

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People with a mental disorder, substance use disorder, or both are overrepresented in criminal legal systems (1). Advocates argue that community-based mental health and substance abuse treatment services (community behavioral health services [CBHS]) can reduce incarceration (2), but empirical tests of the effect of CBHS on criminal recidivism have yielded mostly null or mixed results (3–6). These results, however, may not be generalizable to people with behavioral health problems or to specific diagnostic groups.

Two factors constrain the generalizability of research on CBHS and recidivism. First, research has almost exclusively focused on service use among people with serious mental disorders. Second, research has siloed diagnostic groups and services, looking mostly at the effect of mental health services on people with serious mental disorders (3) or, infrequently, at the effect of substance abuse treatment services on people with substance use problems (7). This focus on serious mental disorders and the siloing of diagnostic groups and services leave unexplored the effect of services on a broader group of potential beneficiaries (i.e., people with any mental disorder, as well as people with co-occurring mental and substance use disorders). Further, without considering both mental health– and substance abuse–focused services and distinguishing effects between diagnostic groups, variable treatment effects and outcomes may be masked.

Although mental and substance use disorders are treated as distinct by researchers, people involved in criminal legal systems with mental or substance use disorders overlap considerably (8), likely use an array of mental health and/or substance abuse treatment services, and may derive different benefits from services.

This study assessed the effect of any use of CBHS on recidivism among people with any mental or substance use disorder, and whether effects vary between diagnostic

HIGHLIGHTS

- The effect of community behavioral health service (CBHS) use differed among persons on probation with any mental disorder, any substance use disorder, or co-occurring mental and substance use disorders.

- Although effects were not significant for the overall sample, those with any substance use disorder, or co-occurring disorders, CBHS use was significantly associated with reduced recidivism among persons on probation with any mental disorder.

- For persons on probation with any mental disorder, CBHS use in any given week yielded an estimated 64% reduced risk of recidivism during the following week.

groups. We used a longitudinal data set that integrates court, probation, and CBHS data of people on probation with a disorder (N=772). We estimated the potential benefit CBHS could realize to reduce recidivism among people with any mental or substance use disorder or with co-occurring disorders and discuss implications for future research and policy.

METHODS

This study included all people starting probation between October 2011 and June 2014 in San Francisco. We identified people who had any mental and/or substance use disorder diagnosis prior to starting probation (N=942); 772 (82%) had complete data and constituted our final sample. People with complete and incomplete data did not substantially differ in terms of observed data.

The study's outcome was time to recidivism on the basis of arrests documented in court records. We measured time as weeks under probation supervision, beginning with the probation start date and ending with a recidivism or the censor date (July 1, 2014). The median observation period was 28 weeks; 51% (N=396) were rearrested.

Our treatment variable was use of any service in a given week t. Services included those focused on mental health or substance abuse and delivered in outpatient, day treatment, and residential contexts. The moderator of interest was diagnosis type and included three categories: any mental disorder, any substance use disorder, and co-occurring mental and substance use disorders. Diagnoses were made by licensed clinicians in accordance with the *DSM-IV* (9). We drew service and diagnostic data from an electronic health record (EHR) system used by providers who receive public funds. Diagnosis type and service type were concordant. Among the 123 people with any mental disorder who received services, 107 (87%) received only mental health services; among the 81 people with any substance use disorder who received services, 68 (84%) received only substance abuse services; and among the 101 people with co-occurring disorders who received services, 49 (49%) received only mental health services, 29 (29%) received only substance abuse services, and 23 (23%) received both mental health– and substance abuse–focused services. Although some contacts may have been omitted, the rate of service receipt was comparable to or higher than rates in other samples (10): 305 out of 772 people (40%) used one or more services.

We considered 37 covariates that, on the basis of prior research findings, could confound the service use– recidivism relationship. These included demographic characteristics, behavioral health–related variables, prior service-use variables, and socioeconomic and criminal justice variables. We drew covariate data from probation records, the EHR system, and a criminal risk assessment (Correctional Offender Management Profiling for Alternative Sanctions) (11, 12). From these variables, we used stepwise selection to identify 15 covariates for adjustment. All covariates were measured at baseline except homelessness,

which was assessed at several time points during the study period. We considered statistical models that adjusted for all 37 covariates and found that results were similar to those presented here. To increase precision and statistical power, we focused on results from models that used 15 covariates.

To assess the relationship between service use and recidivism, we used a time-dependent Cox proportional hazards model, where each subject-week is an observation. The model specified the hazard rate (HR) of recidivism during a given week (t) as a function of baseline covariates, homelessness in the previous week ($t-1$), and service use in the prior 4 weeks ($t-1$ through $t-4$). To test whether diagnosis type moderates the relationship between service use and recidivism, we examined the interaction between service use in $t-1$ and diagnosis type, with any mental disorder as the reference group. Assuming no unmeasured confounding or misspecification, this analysis measures the effect of service use in $t-1$ on recidivism risk in t for those with any mental disorder, with adjustment for covariates (13, 14), compared with those with any substance use disorder or with co-occurring disorders. By including service use in $t-2$ through $t-4$, we targeted the effect of recent service use rather than all past use (14); this approach implicitly adjusts for potentially confounding latent characteristics that led people to use services prior to $t-1$. We fit our model using the "survival" R package (15). Procedures were approved by institutional review boards at the University of California, Berkeley and the University of Pittsburgh.

RESULTS

We first assessed the overall effect of service use among people with any mental or substance use disorder. Service use was associated with lower recidivism risk in the following week (after adjustment for baseline covariates, homelessness, and prior service use [see Table 1]), but this effect was small and not statistically significant (HR=0.71, p=.149, 95% confidence interval [CI]=0.44, 1.13).

Next, we assessed the interaction between service use and diagnosis type and adjusted for covariates. Service use was associated with a 64% reduced risk of recidivism in the following week among those with any mental disorder (HR=0.36, p=0.008, 95% CI=0.17, 0.77). We found moderate evidence that this beneficial effect was lower for those with co-occurring disorders than for those with any mental disorder (HR=2.19, p=0.065, 95% CI=0.95, 5.04). This interactive effect represented the effect of service use on those with co-occurring disorders relative to those with any mental disorder. The corresponding HR for those with co-occurring disorders was <1 but was not statistically significant. For those with any substance use disorder, the effect of service use was worse than for those with any mental disorder (HR=3.43, p=0.004, 95% CI=1.50, 7.85). The HR for those with any substance use disorder was >1 but was not statistically significant. In short, service use was significantly protective among those with any mental disorder but

did not reach statistical significance among those with co-occurring disorders or with any substance use disorder.

DISCUSSION

This study adds to research on use of CBHS and recidivism by sampling a broad group of potential beneficiaries, considering mental health and substance abuse services, and assessing variability in effects across diagnostic groups. Before we accounted for variation across groups, use of CBHS was not significantly associated with recidivism in this study. However, when diagnostic groups were considered, service use was associated with significant reductions in recidivism among those with any mental disorder. The effect of service use on people with co-occurring disorders was also associated with reduced recidivism, but this association was not statistically significant, whereas the effect of service use on people with any substance use disorder was to increase recidivism but again was not statistically significant.

Prior research indicates that, among people with serious mental disorders, use of mental health–focused services is not associated with reductions in recidivism (16). We found that among people with any mental disorder (including nonserious disorders but excluding co-occurring substance use), service use was associated with reductions in recidivism. This finding suggests that prior conclusions regarding the irrelevance of CBHS to recidivism reduction may not be generalizable to service users with any mental disorder and may inappropriately reduce confidence in investing in CBHS to reduce incarceration.

Among people with any substance use disorder, we found that service use predicted an increased risk of recidivism, although our results were not statistically significant. Prior

TABLE 1. Recidivism, service use, and other sample characteristics, by diagnostic group[a]

Characteristic	Mental disorder (N=329)		Substance use disorder (N=243)		Co-occurring disorders (N=200)	
	N	%	N	%	N	%
Rearrested	156	47	142	58	98	49
Attended any service	123	37	81	33	101	51
Attended residential services	24	7	8	3	15	8
Attended medication-related services	77	23	51	21	60	30
Attended day treatment services	12	4	2	1	9	5
Attended outpatient therapeutic services	110	33	80	33	79	40
Attended ancillary services	75	23	3	1	48	24
Age (M±SD years)	36.0±13.1		39.3±11.2		37.3±11.8	
Male	265	81	205	84	160	80
Race-ethnicity						
White	97	30	63	26	77	39
Black	179	54	130	54	85	43
Latinx	20	6	28	12	25	13
Asian/Pacific Islander	23	7	17	7	11	6
Another	10	3	5	2	2	1
Recidivism risk score (M±SD)[b]	.0±.8		.4±.6		.4±.7	
Supervision level						
Low	92	28	23	10	27	14
Medium	32	10	17	7	22	11
Medium-high	56	17	51	21	43	22
High	149	45	152	63	108	54
Homeless (at any point during the observation period)	116	35	105	43	114	57
Employed	49	15	35	14	14	7
High school graduate/GED	225	68	160	66	135	68
Drug trafficking index offense	25	8	60	25	25	13
N of drug possession arrests (M±SD)	1.2±1.3		2.3±1.3		1.8±1.1	
Using alcohol at time of index offense	76	23	83	34	78	39
Perceived need for alcohol treatment	79	24	84	35	87	44
Drug use in youth	66	20	102	42	81	41
Opioid use disorder	0	—	47	19	30	15
Prior psychiatric hospitalization	39	12	0	—	36	18

[a] Recidivism, service attendance variables, and homelessness were measured prospectively. Prior psychiatric hospitalization was measured retrospectively. All other variables were measured at baseline. GED, general equivalency diploma.
[b] Scores were gleaned from the Correctional Offender Management Profiling for Alternative Sanctions and ranged from −2.55 to 1.72, with higher scores indicating greater risk of recidivism.

research indicates that services can backfire, increasing recidivism (5). This may be especially true for substance abuse services, where enhanced social control and surveillance can accompany services that often target a criminal activity (i.e., illicit drug use). Here, the combination of risk-increasing substance abuse services and risk-reducing mental health services diluted the overall effect of CBHS on recidivism across the larger sample, making CBHS nonsignificant. Similarly, this may explain the small and nonsignificant effect of service use on recidivism among people with co-occurring disorders (who used a mix of mental health and substance abuse services) in this study and in prior research.

These results should be interpreted in light of several limitations. First, the study was observational. Although we assessed the relationship between service use and recidivism, we could not completely mitigate the possibility that unobserved covariates explain this relationship (e.g., we could not directly account for symptoms). However, with a time-dependent proportional hazards model, we accounted for an array of variables, many of which are potential confounders and likely correlate with symptoms. Second, reliance on administrative data may lead to the omission of some services and people with diagnoses of interest. This may especially be true for substance use disorders, for which people are less likely to receive services and diagnoses (10). Given the economic circumstances of people in the sample and the robustness of CBHS in San Francisco, we likely included a majority of services. Still, future research using diagnostic interviewing is warranted. Third, we were not able to fully capture service characteristics (e.g., quality) or rule them out as confounders. We examined effects by service type and found no evidence that service type confounded the interactive effect of service use and diagnostic group on recidivism, but we cannot rule out the possibility that differences in effects reflected differences in services among diagnostic groups more than differences in treatment responsiveness among those groups. Finally, sample and service system characteristics varied across locales. Thus, findings are most generalizable to similar probation populations and contexts.

CONCLUSIONS

The relationship between use of CBHS and criminal recidivism differed among diagnostic groups. Use of CBHS was associated with reduced recidivism among people with any mental disorder, but not among those with any substance use disorder or co-occurring disorders. To fully capture the effect of CBHS on recidivism, future studies should account for differences between diagnostic groups and consider effects on those with nonserious and serious diagnoses. Further, future research should test potential drivers of differential effects in diagnostic groups. Regarding policy, our findings support calls to expand mental health services to reduce incarceration among people with any mental disorder. Findings also indicate that before service expansion is considered, substance abuse services that demonstrate reductions in recidivism need to be identified. Ultimately, use of CBHS has the potential to reduce recidivism, but that potential depends on population and service characteristics.

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