



Mental Health Clubhouse Services in Washington State: An Evaluation

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FROM 2005 UNTIL 2012, Washington State offered mental health clubhouse (MHC) services under the state's 1915(b) Medicaid waiver as (b)(3) service. In MHCs, consumers with mental illness and/or co-occurring disorders receive employment and recovery support services in inclusive, member-driven environments. Following the termination of the 1915(b)(3) services in June 2012, the number of MHC service providers declined across Washington State and clubhouse services were only available in select areas receiving targeted state and local support. Recent legislative interest in expanding the existing MHC network prompted the formation of a work group to: 1) examine the effectiveness of MHC services, and 2) explore options for expanding clubhouse services statewide. To address the first objective, this report compares outcomes for MHC clients (members) who received clubhouse services between January 2009 and June 2012 with a matched comparison group of similar individuals who did not receive clubhouse services but received other mental health treatment ("treatment as usual"). The evaluation examines the effect of MHC services on a range of behavioral health, physical health, and social outcomes.

Mental Health Clubhouse Services: Outcomes One Year After

These analyses indicate that changes in client outcomes did not significantly differ between MHC members and the matched comparison group across the majority of metrics examined here.

Compared to similar adults receiving other mental health services, MHC members were...*

- More likely to remain in SUD treatment
- Less likely to be arrested
- More likely to use crisis services
- More likely to remain homeless

No significant differences were observed in...*

- Self-harm incidents
- Emergency-department visits
- Inpatient psychiatric hospitalizations
- Hospitalizations (for physical health)
- Outpatient mental health treatment
- Employment rates
- Medicaid enrollment

*Statistical significance at $P < 0.05$.

MHC ORIGINS. Based on the innovative **Fountain House** model of community mental health services, mental health clubhouses (MHCs) were among the first of a series of consumer-oriented services that emphasized consumer control, the equality of staff and clients, and the understanding that staff and clients are mutual collaborators in the recovery process (Tanaka, Craig, & Davidson, 2015). Like many other consumer-oriented or consumer-run services, MHCs are structured around the principle that individuals with mental illnesses can achieve mainstream life goals when provided with that opportunity and the support of others who are in recovery. In line with these principles, MHCs strive to create an inclusive environment that empowers clients (commonly referred to as "members") by encouraging them to engage in self-directed pursuits and actively access additional behavioral health treatment services.

Background

Program Services

MHCs are known to offer a wide range of services to members, including:

- Rehabilitation services within a supportive, member-driven environment.
- Participant socialization through drop-in meetings, support groups, and other peer support.
- Access to housing services and the opportunity to explore various community housing options.
- A variety of leisure, wellness, and work activities/opportunities that create structure in members' lives and help them achieve "socially and vocationally satisfying lives" (Lucca 2000, p. 89).

In addition to the focus on client empowerment and socialization, MHCs also provide members with opportunities to develop the skills they need to be competitive in the labor market. Chief among these is the "work-ordered day," where members collaborate with clubhouse staff as part of work units that contribute to the day-to-day functioning of the clubhouse. The incorporation of both staff and MHC members into these work units affords members the opportunity to make shared decisions with staff concerning the daily operation of the clubhouse, encourages the development of collegial relationships between staff and members, and contributes to a sense of ownership and belonging among clubhouse members.

Outside of the work-ordered day, members may also participate in transitional, supported, and independent employment programs. These activities differ in the intensity of services that a member receives while employed, the level of responsibility associated with the position being filled, and whether the job is controlled by the clubhouse or obtained competitively by the client. This creates a graduated approach to employment and community integration that allows members to become progressively more independent and to practice job skills in settings outside of the clubhouse.

In 2005, the State of Washington received a 1915(b) waiver that allowed mental health providers to bill Medicaid for MHC services. Billable MHC activities under the 1915(b)(3) portion of the waiver included peer support services, drop-in meetings, and assistance with employment opportunities.¹

Past Research Findings and Hypotheses

Past research conducted on MHCs in the United States and abroad indicates that the array of pre-vocational, psychosocial, and recovery services offered by MHCs are associated with improvements across a range of outcomes.² These include:

- Increased participation in mainstream education and employment opportunities.
- Reductions in member psychiatric hospitalization rates following MHC participation.
- Higher rates of outpatient service access.
- Improvements in member well-being and reductions in acuity of mental health disorders.

Based on these findings, we developed a series of hypotheses (Table 1) that are testable using available administrative data.

¹ Clubhouse certification guidelines were passed into state law in June 2008 that outlined criteria for MHC certification; however, providers did not have to be certified to bill Medicaid for these services. Clubhouse services and certification requirements applicable during the evaluation period are detailed in WACs 388-865-0700, 388-865-0705, 388-865-0710, 388-865-0715, and 388-865-0720.

² See Di Masso, Avi-Itzhak, & Obler, 2001; Macias, Barreira, Alden, & Body, 2001; Macias et al., 2006; McKay, Nugent, Johnsen, Eaton, & Lidz 2016. Additional outcomes associated with clubhouse participation include improvements in emotional coping, member social skills, and the strengthening/expansion of existing social support structures (Conrad-Garrisi & Pernice-Duca 2013; Mandiberg & Edwards, 2013; McKay, Nugent, Johnsen, Eaton, & Lidz 2016; Tanaka 2013; Yau, Chan, Chan, & Chui, 2005).

TABLE 1

Hypothesized Effect of Clubhouse Services on Outcomes of Interest

Receipt of mental health clubhouse services will...	
Reduce ↓	Increase ↑
<ul style="list-style-type: none"> • Self-harm incidents • Arrests • Housing instability • Homelessness • Emergency department outpatient visits • Emergency-department-related inpatient events • Inpatient psychiatric hospitalizations • Other hospitalizations • Use of crisis services • Use of stabilization services 	<ul style="list-style-type: none"> • Engagement in outpatient mental health services • Engagement in SUD treatment • Medicaid persistence • Employment rates

Methods

Study Population

This study focuses on working age adults ages 18 to 64 who received medical assistance for at least one month in the year prior to and following MHC enrollment.³ Individuals were included in the study as a MHC member if they received any service with a Healthcare Common Procedure Coding System (HCPCS) code of "H2031" between January 1, 2009 and June 30, 2012 and had not previously received any MHC services. Members of the MHC population were each matched to two similar individuals selected from a pool of mental health clients who met the broader eligibility criteria, received mental health services during that same time period, but did not receive MHC services at any time prior to the end of the evaluation period.

The final study population includes 618 individuals in the MHC group and 1,170 individuals (1,236 events/observations) in the matched comparison group.⁴ After matching, balance was achieved across these two populations for a wide range of baseline characteristics, including the outcomes identified in Table 1 above, client demographics, mental health diagnoses, service receipt history, and contextual factors (e.g., population density at the census tract and county levels). A comparison of client characteristics for those individuals included in the MHC member population and matched comparison is available in the Appendix.

To compare changes in client outcomes between the 12-month pre- and post-periods, each member of the MHC population was assigned an "index month" corresponding to the first month that they received MHC services. This index month was then used to define the 12-month pre- and post-periods. The index month for individuals in the matched comparison group corresponds to the month that an individual met the eligibility criteria for inclusion in the study (see Technical Notes for more detail).

³ Information on additional restrictions applied to our analyses are available in the Technical Notes section of this report.

⁴ The 618 clients who received MHC services were matched to 1,170 unique individuals selected from the pool of potential controls using a 2-to-1 nearest neighbor matching approach without replacement. Because they qualified for inclusion in the pool of potential controls multiple times, a number of individuals in the control population contributed more than one observation to the comparison group, resulting in a total of 1,236 total observations. See the Technical Notes for more detailed information on these eligibility criteria and the construction of the matched comparison group.

Statistical Analyses

We employed a difference-in-difference (DID) framework to estimate the effect of MHC services by comparing changes in client outcomes for the treatment and comparison groups in the 12-months prior to and following their index months.⁵ Results presented here are based on the unadjusted DID estimates with standard errors corrected to adjust for individuals who appear multiple times in the comparison group. Additional multivariate analyses (not shown) that included adjustments for residual differences in baseline characteristics between MHC members and the matched comparison group produced results comparable to the unadjusted DID estimates presented here.

Q. What is Difference-in-Difference?

Difference-in-difference (DID) rates are calculated as the difference in change over time between the treatment and comparison groups. For example, to calculate the DID arrest rate, we followed the steps below:

- Calculate pre-post change in arrest rates for the comparison group:
20.7% in pre-period and 20.2% in post-period = -0.5%
- Calculate pre-post change in arrest rates for clubhouse members:
19.7% in pre-period and 14.6% in the post period = -5.1%
- Calculate the difference-in-difference rate:
 $(-5.1\%) - (-0.5\%) = -4.6\%$

Outcomes

Contrary to prior findings, the analyses indicate that changes in client outcomes over time did not significantly differ between the MHC and matched comparison groups for the majority of metrics examined, including several key measures of interest (e.g., employment, re-hospitalization). Statistically significant effects were noted in four outcome areas, but in two of these areas (homelessness and crisis service receipt) MHC members did worse than the matched comparison group. The results of these analyses are presented in Table 2 below. We highlight select measures in the remainder of the text.

TABLE 2

Results of the Matched Comparison Analyses

	Matched Comparison Group		MHC Members		Unadjusted DID	Statistically Significant
	12-Month Pre-Period	12-Month Post-Period	12-Month Pre-Period	12-Month Post-Period		
Self-Harm Event	5.4%	5.6%	6.2%	5.5%	-0.9%	N.S.
Arrested	20.7%	20.2%	19.7%	14.6%	-4.6%	p < 0.05
Unstably Housed or Homeless	37.4%	30.9%	37.4%	33.0%	2.1%	N.S.
Homeless	23.1%	15.1%	21.7%	19.1%	5.4%	p < 0.01
ED Outpatient Visit	64.0%	59.7%	64.2%	63.3%	3.4%	N.S.
Hospitalization (ED or non-ED)	14.7%	17.3%	16.2%	16.3%	-2.5%	N.S.
ED Inpatient Event	11.3%	14.2%	11.8%	13.8%	-0.9%	N.S.
Inpatient Psychiatric Hospitalization	17.8%	11.0%	17.8%	11.3%	0.3%	N.S.
Other Outpatient MH Services	88.8%	91.5%	88.4%	90.3%	-0.8%	N.S.
Crisis Services	38.1%	25.2%	39.6%	34.1%	7.4%	p < 0.01
Stabilization Services	10.9%	5.4%	12.5%	10.2%	3.2%	N.S.
SUD Services	23.0%	20.0%	23.1%	24.1%	4.0%	p < 0.05
Months of Medicaid Receipt	10.1	10.8	10.0	10.9	0.2	N.S.
Employed	17.3%	10.7%	17.3%	11.0%	0.3%	N.S.

⁵ Additional sensitivity analyses were conducted using pre-post comparisons, paired t-tests, and other methodological approaches. The results of these analyses were consistent with the findings presented here.

FIGURE 1

Employment Rates

DIFFERENCE-IN DIFFERENCE = 0.3%, N.S.

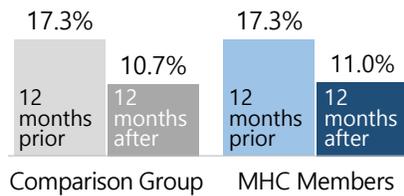


FIGURE 2

Crisis Services

DIFFERENCE-IN DIFFERENCE = 7.4%, $p < .001$

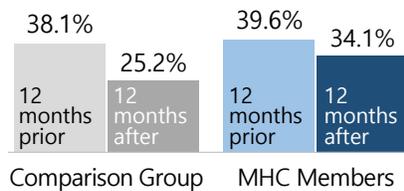


FIGURE 3

Mental Health Inpatient Event, Any Type

DIFFERENCE-IN DIFFERENCE = 0.3%, N.S.

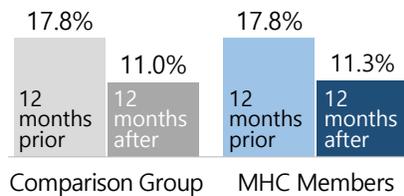


FIGURE 4

Arrests, Any Type

DIFFERENCE-IN DIFFERENCE = -4.6%, $p < .05$

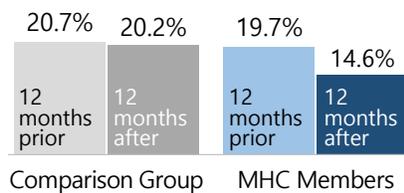
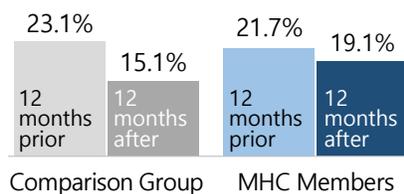


FIGURE 5

Homelessness

DIFFERENCE-IN DIFFERENCE = 5.4%, $p < .01$



Employment. Baseline employment rates were low among both clubhouse members and the matched comparison group, with roughly 1 in 6 (17 percent) having worked in the year prior to the index month. Employment rates declined for both groups in the 12-month follow-up period. The changes in employment rates did not significantly differ for MHC members relative to the matched comparison group (Table 2).

Behavioral Health. As shown in Table 2, MHC members were more likely to sustain their pre-index rates of SUD treatment utilization (DID = +4.0 percent, $p \leq 0.05$) relative to individuals in the matched comparison group, who reduced their use of those services. Participation in MHC was not associated with increased utilization of outpatient mental health services as expected. However, MHC participation was associated with increased use of crisis mental health services relative to the control group: while client utilization of crisis mental health services declined for both groups, the declines were less pronounced for MHC members (DID = 7.4 percent, $p < 0.01$).

The MHC and matched comparison groups followed similar pre-post trajectories with regard to inpatient psychiatric hospitalizations: psychiatric hospitalizations were higher prior to index and decreased for both groups in the post-period. The results of the DID analyses (Figure 3) indicate that both groups were similar.

Other Social Risk Factors. The results of the analysis were also mixed with regard to measured social risk factors and outcomes (Figures 4 and 5). MHC participation was associated with fewer arrests; arrest rates declined 4.6 percent more for MHC members relative to the matched comparison group (DID = -4.6 percent, $p \leq 0.05$). By contrast, clients in the matched comparison group experienced significant reductions in homelessness, while homelessness rates were relatively stable among MHC members (DID = +5.4 percent, $p \leq 0.01$).

Additional Analyses. The approach used here to identify MHC participants (as indicated by a H2031 HCPCS code) may have included clients receiving clubhouse services from non-certified providers (e.g., low fidelity MHCs). We performed similar DID analyses comparing MHC members who received services from MHCs certified by the Division of Behavioral Health and Recovery (DBHR) to a matched comparison group. Results were comparable to those presented in this report. Additional analyses accounting for treatment intensity and dual-eligible clients produced similar findings.⁶

⁶ We also examined the effect of number of clubhouse services received on client outcomes for the focal population of this report based on evidence that the clubhouse attendance affects client outcomes (Di Masso, Avi-Itzhak, & Obler, 2001). Exploratory analyses of the unadjusted effect of number of clubhouse services received on individual outcomes were internally consistent, robust to the methodological approach employed, and replicated the findings reported here.

Conclusion

Mental health clubhouse (MHC) services were offered as a (b)(3) service in Washington State from 2005 until 2012 under the State's 1915(b) Medicaid waiver authority. Using a difference-in-difference approach, this evaluation compared the outcomes of 618 working-age clubhouse members who enrolled from January 1, 2009 through June 30, 2012, to those of a statistically matched comparison group. These analyses provide no evidence that MHC services improved member outcomes relative to the comparison group for the following measures: self-harm, housing instability, inpatient and outpatient emergency department use, inpatient physical health hospitalizations, inpatient psychiatric hospitalizations, receipt of outpatient mental health services, or employment. Participation in MHC services was associated with relative improvements in arrest rates and rates of SUD treatment utilization, but relatively worsening rates of crisis mental health service utilization and homelessness.

While these analyses suggest that Washington State MHC services did not outperform "treatment as usual," this should not be considered an evaluation of the mental health clubhouse model in general. Past evaluations examining the effectiveness of MHC services are often restricted to clubhouses that evidence high levels of compliance to international clubhouse standards (*see*, for examples, McKay, Nugent, Johnsen, Eaton, & Lidz 2016; Macias et al., 2006). The MHC population examined here includes individuals who received clubhouse services from agencies that differed in their adherence to international clubhouse standards and, in many instances, were not certified by the Division of Behavioral Health and Recovery to provide clubhouse services. Due to concerns about data completeness, we also removed clubhouse members who were dually-enrolled in Medicaid and Medicare or had other third-party liability coverage from the analysis. Consequently, the findings reported here are applicable only to mental health clubhouse services in Washington State delivered to Medicaid clients during the study timeframe.

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APPENDIX

TABLE A1.

Baseline Characteristics

	Mental Health Clubhouse Services	
	Matched Comparison Group	
TOTAL CASES	1,236	618
Demographics		
Mean Age at Baseline	40.8	40.7
18 - 24 Years of Age	9%	10%
25 - 34 Years of Age	21%	19%
35 - 44 Years of Age	27%	30%
45 - 54 Years of Age	34%	31%
55 - 64 Years of Age	9%	10%
White, Non-Hispanic	65%	64%
Minority	35%	36%
African American	13%	13%
Hispanic/Latino(a)	8%	10%
Asian or Pacific Islander	7%	6%
American Indian	13%	14%
Other	19%	20%
Female	47%	47%
Male	53%	53%
Medicaid Coverage, 12 Months Prior to Index		
Title XIX Full Benefit	92%	90%
Disabled Medicaid	81%	81%
Classic Medicaid	11%	10%
Medicaid Coverage, as of Index Month		
Title XIX Full Benefit	91%	89%
Disabled Medicaid	80%	80%
Classic Medicaid	10%	8%
Medical History- Behavioral Health, 24 Months Prior to Index		
Mental Health Service Need Indicator	96%	96%
Mental Illness Diagnosis	95%	94%
Psychotic Disorder Diagnosis	50%	50%
Mania or Bipolar Disorder Diagnosis	48%	46%
Depressive Disorder Diagnosis	71%	70%
Anxiety Disorder Diagnosis	59%	57%
Attention Deficit Hyperactivity Disorder Diagnosis	12%	11%
Disruptive/Impulse/Conduct Disorder Diagnosis	11%	10%
Adjustment Disorder Diagnosis	9%	9%
Serious Mental Illness Indicator	82%	83%
Psychotropic Medication (Any)	87%	87%
Antipsychotic Medication	59%	61%
Antimania Medication	9%	10%
Antidepressant Medication	72%	73%
Antianxiety Medication	48%	48%
ADHD Medication	7%	6%
Substance Use Disorder Treatment Need	54%	53%
Co-Occurring Disorder Treatment Need	53%	52%

Mental Health Clubhouse Services		
	Matched Comparison Group	
Social Service Use, 12 Months Prior to Index		
Division of Vocational Rehabilitation	11%	13%
Developmental Disabilities Administration	3%	2%
Economic Services Administration	93%	93%
Temporary Assistance to Needy Families (TANF)	8%	8%
Basic Food	91%	91%
General Assistance	7%	8%
Disability Lifeline	35%	33%
Federal Supplemental Security Income (SSI)	48%	50%
Aging and Long-Term Services Administration	7%	7%
Home and Community-Based Services	6%	6%
Other History for All Clients, 12 Month Prior to Receiving Services		
Employed	17%	17%
Unstably Housed	37%	37%
Homeless without Housing	23%	22%
Ever Arrested	21%	20%
Any Misdemeanor Arrest	8%	7%
Any Gross Misdemeanor Arrest	7%	7%
Any Felony Arrest	8%	6%
Ever Convicted of a Crime	17%	18%
Behavioral Health Treatment Services, 12 Months Prior to Index		
Any Mental Health Outpatient Services	90%	91%
Individual Treatment Services	78%	80%
Group Treatment Services	23%	24%
Peer Support Services	5%	5%
Supported Employment Services	5%	5%
Crisis Services	38%	40%
Stabilization Services	11%	12%
Co-Occurring Treatment Services	4%	5%
Inpatient Psychiatric Hospitalization	18%	18%
Substance Use Disorder Treatment Services	23%	23%
Any Substance Use Disorder Outpatient Treatment	17%	19%
Inpatient Substance Use Disorder Treatment	10%	10%
Medical History- Physical Health, 12 Months Prior to Index		
Chronic Disease Burden at or Above Average for SSI Population	53%	53%
ED Outpatient Visit (1 or more)	64%	64%
ED Outpatient Visit with Corresponding Mental Health Diagnosis (1 or more)	39%	42%
ED Inpatient Hospitalization (1 or more)	11%	12%
Any Inpatient Hospitalization - General Medical Setting	15%	16%
Any Self-Harm Event	5%	6%
Total Number of ED Visits or Inpatient Admissions Per 1000 Member Months, 12 Months Prior to Index		
Number of ED Outpatient Visits	307.8	306.4
Number of ED Inpatient Hospitalizations - General Medical Setting	20.6	17.5
County and Census Tract Characteristics of Residence, as of Index Month		
Average Weighted Percentage of Population with a Serious Mental Illness, County	3%	3%
Average Estimated Population Density, County	345	318
Average Estimated Population Size, County	527,498	496,614
Average Estimated Population Density, Census Tract	5,250	4,881
Average Estimated Population Size, Census Tract	4,730	4,754
Average Unemployment Rate, County	9%	9%

OVERVIEW AND STUDY POPULATION

A total of 1,379 individuals between the ages of 18 and 99 received a mental clubhouse service through the publicly-funded mental health system between January 1, 2009 and June 30, 2012 and had never received these services prior to the intake window. These individuals were identified based on medical claims data indicating that they received a service with a Healthcare Common Procedure Coding Systems (HCPCS) code of "H2031" (mental health clubhouse, per diem). This population was then restricted to individuals who: (1) were between the ages of 18 and 64 (i.e., "working age") at index; (2) had at least one month of medical assistance in the 12 months prior to and 12 months following first service receipt; (3) were alive the entirety of the follow-up period; (4) had a known geographic location in the index month; (5) were not residing in a county designated as a rural or frontier area; (6) were not residing in a census tract with missing population density estimates; and (7) did not have additional health insurance through Medicare or another source including private coverage. After applying these restrictions, 623 unique mental health clubhouse members were included in the initial treated population used in the matching process; 618 were successfully matched to observations from the pool of potential controls.

COMPARISON GROUP SELECTION

The matched comparison group was selected from the broader population of mental health clients who received publicly-funded mental health services during the time frame of the study and met the geographic, age, and medical eligibility criteria applied to the MHC population. To be eligible for inclusion in the comparison group, an individual could not have received mental health clubhouse services at any prior time or during a 24-month follow-up period. We then identified each month during the study frame that a client in our comparison population received at least one month of medical assistance in the 12 months prior to and following receipt of an outpatient mental health treatment service. We created a separate observation for each month that a client met these criteria to maximize the possibility of identifying a potential match for each MHC member. The index month for each observation in the control group corresponds to the month that an individual was found eligible for inclusion in the comparison group.

We used the MatchIt procedure in R 3.5.0 (R Core Team 2018) to match individuals in the treatment and control groups based on their estimated propensity to receive the treatment (i.e., mental health clubhouse services). The propensity score model included individual-level measures such as demographics (age, gender, and race/ethnicity), prior mental health history, prior behavioral and physical health risk indicators, prior receipt of mental health services, prior social service use (including TANF and Supplemental Security Income receipt), prior inpatient psychiatric hospitalizations, prior inpatient substance use disorder treatment, prior employment, prior earnings, prior arrests, prior housing instability/homelessness, categorically needy disabled coverage as of the index month, and prior health care use. The model also included county/population measures, such as population density measures at the tract and county levels, county-level unemployment rates, Supplemental Nutrition Assistance Program (SNAP) receipt rates, TANF receipt rates, serious mental illness rates, SUD treatment receipt rates, arrest rates, and death rates.

In addition to matching clients using propensity score matching, we also exact matched clients in the treatment and matched comparison group on several key characteristics:

- Index month.
- Inpatient psychiatric hospitalization in the prior year.
- Inpatient substance use disorder treatment in the prior year.
- Employment status in the prior year.
- Homelessness status in the prior year.

Indicators of the urbanicity of a client's county and census tract of residence were also included as exact match variables to account for regional differences in employment rates, access to mental health care services, and the uneven distribution of mental health clubhouse services across the state.

The matching ratio was 2:1, with each MHC client matched to two unique observations from the pool of potential controls to increase the statistical power of our analyses. We used the absolute standardized mean difference (ASMD) for each of the baseline characteristics selected for the matching process to determine if clients in the treatment and comparison groups were adequately matched. An ASMD score of less than 0.10 was used as an indicator of a well-balanced and matched variable, while an ASMD score between 0.10 and 0.20 indicated adequate matching on the variable in question. Using these criteria, we identified a matched comparison group that was well-balanced on the variables used in the propensity score model and on additional variables not included in the matching process. Table A1 provides information on a subset of the broad range of baseline characteristics used to assess the comparability of mental health clubhouse service recipients and members of the matched comparison group selected for these analyses.

The final population for our analyses included 618 individuals in the treatment group matched to a comparison group of 1,236 observations (corresponding to 1,170 unique individuals) selected from the pool of potential controls. The calendar year quarter containing an individual's index month was identified as the "index quarter" that was used for employment outcomes including employment rates, earnings, and hours worked and for determining quarterly inpatient psychiatric hospitalization rates. Baseline characteristics were measured over a 12- or 24-month period prior to the index month, while outcomes were measured over a 12-month post-period following the index month. Outcomes for employment were measured over a 4-quarter post-period that excluded the index quarter.

Following the development of the matched group, all other analyses were conducted using SAS 9.4 (SAS Institute, Cary NC). Difference-in-difference models were estimated using PROC REG to assess the impact of MHC services on client outcomes in the 12 months prior to and following first service receipt. Because an individual could qualify for inclusion in the comparison group for multiple months and, consequently, be matched to more than one individual in the treated population, all standard error estimates were adjusted to account for this possibility. Additional outcome analyses were also adjusted for remaining differences in baseline characteristics between the treatment and control groups by including these variables as covariates in the DID models. Sensitivity analyses were conducted using pre-post comparisons, paired t-tests, and other methodological approaches in SAS to determine if the results generated by this approaches differed from one another. The results of these analyses are internally consistent with the findings presented here.

LIMITATIONS

Selection bias is an inherent risk in attempting to draw causal inferences from observational data. We control for a portion of this selection bias by using the propensity score matching process described above with variables available in the Integrated Client Database (e.g., demographics, employment trajectory, and prior mental health service history) to identify a comparison group that, in the aggregate, closely resembles MHC members. However, unobserved variables such as client engagement, motivation, and level of functioning that are not available in administrative data may influence the likelihood of participating in MHC services.

We included a series of contextual-level measures (e.g., urbanicity based on the population density and urban/rural character, population size, and unemployment rates) captured at both the county and census tract levels as matching criteria for selecting the comparison group. Values on these measures were assigned to an individual based on the client's place of residence as of their index month. These measures were included in the model to account for differences in the availability of clubhouse services across Washington State (which were concentrated in a few, mostly urban areas of the state) and regional factors that may be related to client-level outcomes. Although the treatment and comparison groups were well balanced on these contextual measures, the groups were not as well matched on geographic units such as county.

While the results of this evaluation run counter to prior research on the effectiveness of MHC services, these differences may be attributable to the types of MHCs included in the current evaluation. Past evaluations exploring the effectiveness of MHC services are often restricted to clubhouses that evidence high levels of compliance to international clubhouse standards (see, for examples, McKay, Nugent, Johnsen, Eaton, & Lidz 2016; Macias et al., 2006). Although an evaluation of clubhouses accredited by Clubhouse International in Washington State is desirable and may produce results comparable to findings reported in the broader research literature, analyses restricted to only internationally-accredited clubhouses were not feasible given that only one accredited clubhouse (Evergreen Clubhouse) in Washington appears in the administrative data for this time period. Information on the other accredited Clubhouse that was operating at this time (Hero House) is not available in our historical administrative data.

DATA SOURCES AND MEASURES

Demographics

- Demographics (age, race/ethnicity, and gender) were drawn from the Department of Social and Health Services' (DSHS) Integrated Client Database (ICDB; Mancuso 2014) using information from DSHS and health service systems.

Geography

- Using U.S. Census data, a measure of "urbanicity" was constructed based on the county-level population density and percent of each county's population residing in an urbanized area. Clients were assigned to one of the following categories based on their county of residence in the index month: 1) rural – frontier, 2) rural, 3) large town, 4) urban – low or medium density, and 5) urban – high density.

Outpatient Mental Health Service Encounters

- Service encounter records in ProviderOne and the Mental Health Consumer Information System were used to track outpatient mental health services. Specific service modalities were identified using Healthcare Common Procedure Coding Systems (HCPCS) codes and/or Current Procedure Terminology (CPT) codes. HCPCS code H2031 denotes mental health clubhouse services.

Inpatient Data

- Information on client inpatient stays was obtained from the Health Care Authority's Provider One system, the Consumer Information System (CIS) maintained by the Department of Social and Health Service's Division of Behavioral Health and Recovery, and state hospital records. Spans of inpatient service were transformed into a series of flags that indicated whether a client received treatment in an inpatient setting in a given month and year. These flags were then used to determine when a client exited an inpatient setting during the study period.

Medical Coverage

- Medicaid and other medical coverage was obtained from eligibility codes recorded in ProviderOne.

Behavioral Health and Chronic Illness

- Mental illness, substance use disorder treatment need, and chronic illness indicators are derived from administrative data in ProviderOne, the Treatment and Assessment Report Generation Tool (TARGET), and the Consumer Information System (CIS). These measures were calculated over a 12- or 24-month period prior to enrollment and were restricted to those participants with at least one month of medical eligibility during the 12 months prior to the index month.
- Data from three information systems—ProviderOne (medical), TARGET (substance use disorders), and CIS (mental health disorders)—were used to identify the presence of substance use disorders and/or mental illness over a 24-month window prior to enrollment based on health and behavioral health diagnoses, prescriptions, and treatment records.
- Drug and alcohol-related arrest data maintained by the Washington State Patrol (e.g., arrests for Driving Under the Influence/DUI) were also used to identify substance use issues and were included in the definition of treatment need for substance use disorders.
- An indicator of chronic illness was developed to identify individuals with significant health problems. A risk score equal to 1 is the score for the average Medicaid participant in Washington State meeting Supplemental Security Income disability criteria. Chronic illness risk scores were calculated from health service diagnoses and pharmacy claim information, with scoring weights based on a predictive model associating health conditions with future medical costs (Gilmer et al., 2001; Kronick et al., 2000).

Housing Instability

- The housing instability flag indicates whether a client was homeless or experienced some form of housing instability during the measurement period. This flag was assigned to a client if they were unstably housed (i.e., homeless with housing), paying nominal rent, homeless without housing, living in an inappropriate situation, received emergency housing services, or residing in a domestic violence shelter as recorded in the Automated Client Eligibility System (ACES). Participants paying nominal rent were identified using the at-home living arrangement code (AH) but were paying \$25 or less in rent based on shelter expense data for that time.
- The homelessness flag is restricted to individuals designated as homeless without housing (HO) based on ACES living arrangement data.

Emergency Department Use and Physical Health Hospitalizations

- Emergency department use was identified from ProviderOne medical claims and encounters for Medicaid clients.

Public Assistance

- Basic Food and TANF receipt were identified using data from the DSHS Automated Client Eligibility System (ACES) summarized in the ICDB.

Employment

- Employer-reported data on quarterly employment status, earnings, and hours worked came from the Washington State Employment Security Department (ESD) Unemployment Insurance wage file. Individuals were flagged as employed if they had at least one quarter of non-zero earnings during the calendar year prior to enrollment. Yearly earnings were calculated by summing quarterly earnings within each calendar year.

Criminal Justice Involvement

- Arrest rates were based on offenses reported to the Washington State Patrol, which include arrests for felonies, gross misdemeanors, and other offenses. Washington State Patrol records arrests regardless of whether they led to a conviction. Some less serious misdemeanor offenses or non-criminal infractions handled by local law enforcement agencies were not required to be reported in the WSP database and so could not be included in the analyses.



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