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Managing substance use for clients with serious mental illnesses: Knowledge, attitude, and training challenges among outpatient behavioral health providers in California, Ohio, and New York[☆]

Erin Kelly^{a,*}, Fred J. Pasquarella^b, Lisa Davis^c, Andrew Hunt^d, Sae Lee^b, Scott Fairhurst^e, Leslie Giambone^f, Lezlie Murch^g, Helle Thorning^h, John S. Brekkeⁱ

^a Department of Family and Community Medicine, Thomas Jefferson University, United States of America

^b Didi Hirsch Mental Health Services, Sepulveda Blvd, Culver City, CA, United States of America

^c Center for Health Services and Society, University of California, Los Angeles, 10920 Wilshire Blvd # 300, Los Angeles, CA 90024, United States of America

^d Department of Psychiatry, Case Western University Hospitals, 10524 Euclid Ave, Cleveland, OH 44106, United States of America

^e Pacific Clinics, 800 South Santa Anita Blvd, Arcadia, CA, United States of America

^f Mental Health America Los Angeles, East 7th Street, Long Beach, CA 90804, United States of America

^g Exodus Recovery, Incorporated, 9808 Venice Boulevard, Los Angeles 90232, United States of America

^h Columbia University, Department of Psychiatry, New York, NY, United States of America

ⁱ Suzanne Dworak-Peck School of Social Work, University of Southern California, Montgomery Ross Fisher Building, Los Angeles, CA 90089, United States of America

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ABSTRACT

Purpose: Individuals with serious mental illness have high rates of substance use. The most commonly used substances among this population are alcohol and cannabis, and whether clinical providers delivering mental health services feel adequately prepared to address substance use is unclear. While information about the effects of alcohol are well established, the effects of cannabis are less well known and staff may feel less confident in their abilities to assess its use and may rely on more informal sources to learn about it.

Methods: Mental health agencies in three states (California, Ohio, and New York) surveyed their staff ($n = 717$) to explore their knowledge, training, and expertise in assessment of substance use generally as well as cannabis and alcohol specifically.

Results: Overall, providers felt more prepared to address their clients' alcohol use than cannabis use. In between-state comparisons, California providers felt significantly less well prepared to assess, discuss, and refer their clients to treatment compared to Ohio and New York providers. Using a series of multi-categorical mediation models, we confirmed that deficits in training for these specific substances largely accounted for between-state differences in assessment, capacity, and treatment.

Conclusions: Substance use training to address the service needs of individuals with co-occurring disorders is insufficient and a significant need exists for systemic changes to workforce training of community mental health providers.

1. Introduction

The high rates of co-occurring mental health and substance use disorders are a persistent challenge for service providers, particularly for

individuals with serious mental illnesses (SMI). According to a Substance Abuse and Mental Health Service Administration (SAMHSA) report (SAMHSA, 2019), out of the 11.4 million adults diagnosed with a SMI in the United States, 3.2 million had a co-occurring substance use

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* Corresponding author at: Center for Social Medicine and Humanities, Department of Psychiatry, Semel Institute, University of California, Los Angeles, United States of America.

E-mail addresses: erin.kelly3@jefferson.edu, elkelly@mednet.ucla.edu (E. Kelly), FPasquarella@didihirsch.org (F.J. Pasquarella), lgdavis@mednet.ucla.edu (L. Davis), Andrew.Hunt@uhhospitals.org (A. Hunt), slee@didihirsch.org (S. Lee), Sfairhurst@pacificclinics.org (S. Fairhurst), lgiambone@mhala.org (L. Giambone), lmurch@exodusrecovery.com (L. Murch), Helle.Thorning@nyspi.columbia.edu (H. Thorning), brekke@usc.edu (J.S. Brekke).

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disorder (SUD). Yet only 13.7% of adults with SMI received specialty SUD treatment with mental health services, and 30.5% received no treatment for their SMI or SUD in 2018. Moreover, [Hartz et al. \(2014\)](#) found that including subthreshold substance use (i.e., not only those meeting criteria for SUD) would greatly expand the number of individuals with SMI who could benefit from substance use treatment.

Gaps in the quality and availability of treatment for co-occurring mental health and substance use disorders are well-known (e.g., [Padwa et al., 2015](#)), but surprisingly little empirical evidence supports the notion that training and preparation among mental health providers may significantly impact capacity to address clients' substance use (reviewed by [Petrakis et al., 2018](#)). A dearth of evidence identifies the particular areas of substance use training that providers are especially lacking or that evaluates knowledge of specific substances rather than general substance use treatment ([Salyers et al., 2007](#)). Since alcohol and cannabis are the most common legal and federally illicit substances that those with SMI use ([SAMHSA, 2019](#)), it is especially important that providers are prepared to address these substances among this population. A greater understanding of factors associated with providers' ability to assess and address commonly used substances among mental health service recipients is critical to support the development and allocation of training resources and infrastructure aimed at improving systems of care that serve vulnerable populations. The first goal of the current study is to assess community mental health providers' relative preparedness to address alcohol, cannabis, and substance use generally with their clients who have serious mental illnesses. A secondary aim is to explore whether their preparation relates to various provider or geographic factors and if provider training in substance use can partially account for between-state differences in these provider factors.

1.1. Substance use among individuals with SMI

Polysubstance use is common among U.S. adults and many individuals with SMI have problematic use of two or more substances ([Mueser, 2020](#)). In 2019, although still illegal under federal law, 33 states allowed cannabis use for medical purposes (including Ohio) and 11 states allowed it for non-medical purposes (including California) ([Procon.org, 2019](#)). Over the last two decades, changes in the legal status of cannabis in several states have been associated with increased use of cannabis nationally ([Carliner et al., 2017](#)). Given the high rates of alcohol and cannabis use among individuals with SMI ([Hartz et al., 2014](#)); behavioral health providers must be well trained to discuss, assess, and treat these substance issues with their dual-diagnosis clients. While the deleterious effects of alcohol are well known, research on the effects on cannabis is still nascent. Preliminary evidence suggests that it may be beneficial for some medical and mental health conditions, but evidence also suggests that it can be ineffective or harmful ([Borodovsky & Budney, 2018](#); [National Academies of Sciences, Engineering, & Medicine \[NASEM\], 2017](#)).

For individuals with SMI, particular concerns about cannabis use persist. Some evidence exists that it can exacerbate psychotic symptoms and increase the risk or hasten the onset of psychotic disorders ([Borodovsky & Budney, 2018](#); [Di Forti et al., 2013](#); [Ksir & Hart, 2016](#); [NASEM, 2017](#); [Starzer et al., 2017](#)), or lead to impairments that require intervention ([Volkow et al., 2014](#))—though the evidence is far from definitive ([Ksir & Hart, 2016](#)). Due to the rapid changes in the legal status and the availability of various forms, concentrations, and modalities for consumption of cannabis ([Borodovsky & Budney, 2018](#)), providers may not feel adequately prepared to address cannabis use compared to other commonly used substances, such as alcohol or substance use generally.

1.2. Co-occurring treatment capacity

In addition to provider-level barriers in assessing and addressing substance use, services for substance use and mental health conditions

are delivered in complex, disparate systems of care, which can be problematic ([McGovern et al., 2014](#); [McGovern & McLellan, 2008](#)). Implementation of evidence-based practices is often limited due to many factors, including inadequacies in education, training, assessment of outcomes, supervision, workflow processes, record systems, and funding streams ([Drake & Bond, 2010](#)). In many community mental health centers (CMHCs), services may be limited to screening and treatment referrals to other substance use clinics or other CMHCs, and even then, the capacity to treat those with co-occurring disorders within each of these settings is highly variable. These limitations create challenges for providers in CMHCs who may be hesitant to discuss cannabis use with clients, particularly if they are inexperienced or unlicensed, as many may feel that they are unable to successfully assess, treat or refer individuals with co-occurring disorders to appropriate services.

Two recent large-scale evaluations formally assessed the capacity of substance use and mental health clinics to deliver co-occurring treatment using the Dual Diagnosis Capability in Addiction Treatment (DDCAT) and Dual Diagnosis Capability in Mental Health Treatment (DDCMHT) assessment tools. These evaluations found significant deficits in the capacity of treatment providers to deliver co-occurring treatment. [McGovern et al. \(2014\)](#) evaluated 256 programs (180 substance use, 76 mental health) across 8 states and found that only 19% of substance use programs and 9% of mental health programs were prepared to deliver adequate treatment for co-occurring disorders. In a similar evaluation, [Padwa et al. \(2013\)](#) evaluated the treatment capacity of 30 organizations (10 substance use, 13 mental health, and 7 for both) in Southern California for co-occurring disorders. They found that only 43% of agencies provided services that met cutoffs for DDCAT/DDCMHT criteria for service capacity. The quality of treatment was low for 18 out of the 30 programs. Despite assessment being an area of strength among agencies in this evaluation, only 18 of the 30 programs had routine screening questions for dual diagnosis and only five had procedures for comprehensive assessment. Training was also relatively strong, though we should note that, while 80% of staff had received basic training, only 57% had received advanced training ([Padwa et al., 2013](#)). Overall, these findings suggest that training and the capacity to deliver co-occurring services are suboptimal in many settings.

1.3. The current study

The research team developed the current study as a collaboration among mental health practice-based research networks (PBRNs) in California (the Recovery-Oriented Care Collaborative [ROCC]), Ohio (Behavioral Research and Innovation Network [BRAIN]), and Colorado (Recovery Oriented Collaborative Care [ROCC]), and in partnership with the Assertive Community Treatment Training Institute in New York. At the time of the survey, the legal status of cannabis differed in these states. In California, cannabis had recently become legal for recreational purposes; it became legal in New York for medical purposes only as of 2014, and in Ohio it had recently been made legal for medical purposes but dispensaries were not yet open. First, we explore the relative preparation of providers to address alcohol, cannabis, and substance use generally among their clients with serious mental illnesses in three different states. Second, because it is unclear whether provider training in substance use accounts for between-state differences in their attitudes and comfort with providing these services, we test whether their preparation relates to various provider or geographic factors and if provider training in substance use mediates any between-state differences in these provider factors.

2. Method

2.1. Participants

A convenience sample of behavioral health providers recruited from mental health PBRNs in California, Ohio, and a training institute in New

York completed a short survey about their training; experiences; and attitudes about cannabis, alcohol, and substance use in 2018. Out of 2121 providers who received the survey link, 717 responded (33.8% overall response rate). In California, 462 staff opened the survey, and 410 completed it sufficiently to be included in analyses (29% response rate out of 1429 sent the link; 89% of those who opened the survey). In Ohio, 250 opened the survey link and we include 213 in the final sample (62.6% of 342 sent the link; 85% completion rate). In New York, 105 opened the survey link and 93 are in the final sample (26.6% response rate of 350 sent the link; 89% completion rate). No differences existed between those who fully completed the survey and those who did not in terms of age, gender, race/ethnicity, or state.

2.2. Setting

Data collection occurred within CMHCs in California, Ohio, and New York. These agencies provide comprehensive services to individuals with serious mental illnesses (e.g., schizophrenia, schizoaffective, depression, and bipolar disorders), including those CMHCs known as Assertive Community Treatment (ACT) in New York and Ohio or Full Service Partnership (FSP) in California. In Ohio, a practice-based research network (PBRN), the Behavioral Research and Innovation Network (BRAIN), which comprises four large CMHCs across the state, recruited providers. In California, the ROCC (www.roccpbrn.com), which is also comprises four of the largest agencies in Southern California, distributed the survey. In New York, the New York Assertive Community Treatment Institute, which provides training to 102 ACT teams across the state, recruited providers.

2.3. Procedures

Researchers and providers from CMHCs in California, Ohio, and Colorado developed the survey through their PBRNs. The survey was pilot tested with a focus group of 15 providers in Colorado and modified. In 2018, the team emailed staff members a survey link (via Research Electronic Data Capture [REDCap]) to CMHCs in California in February–April, in Ohio during June–September, and from July to August in New York. REDCap is a secure, web-based software platform designed to support data capture for research studies (Harris et al., 2009; Harris et al., 2019). The Institutional Review Boards, the internal committees of the participating agencies, and the Human Subjects Research Committee of Los Angeles County approved all procedures. All potential study participants received a study information sheet at the start of the survey. Participants participated in a lottery and 30 participants (10 per state) received a \$100 gift card as a token of appreciation for their participation.

2.4. Measures

The measures for this study are drawn from surveys about medical providers' knowledge, beliefs, clinical practices, and training needs around cannabis use (Carlini et al., 2017; Kondrad & Reid, 2013; Uritsky et al., 2011). Additional items added to the survey mirrored the structure of the cannabis items and included ratings of alcohol and general substance use. The team examined all the items for their convergence within substances and discrimination between substances (e.g., how well did items pertaining to cannabis correspond with other cannabis items vs alcohol items). Within-substance items had stronger associations than did between-substance items, which supports their construct validity (see Table 2).

2.4.1. Demographics

Participants self-reported their demographic and workplace characteristics, including their age, gender, race/ethnicity, position title (could check all that applied), years of experience in mental health, years in their current position, and geographic area. Participants could select

multiple job roles that applied to them but we included those that reflected the highest level of training or education. We present self-reported demographic information in Table 1. The table presents all variables as categorical variables. For analytic purposes, the study dichotomized key demographics and used them as covariates for state-level comparisons: Years practicing mental health (0–5 years v. 6 or more years), provider type (licensed v. unlicensed), and geographic region (urban v. nonurban).

2.4.2. Substance use treatment

Providers identified whether their agency offered substance use services, and if so, the types of substance use services provided at their agencies. They also selected all those deemed effective services from a checklist of seven possible treatment models. These services included motivational interviewing, 12-step, group therapy, harm reduction, medication for addiction treatment, brief cognitive, or other (they could also write in a description of “other” treatments). Last, providers identified which barriers might be preventing their clients from receiving substance use services from 11 common barriers reflecting patient-, agency-, and system-level factors. Participants could also write in “other” barriers. The study team calculated a count of barriers for analytic purposes.

2.4.3. Awareness of legal status

Providers checked all that applied from three options regarding the legal status of cannabis in their state (1 = *illegal in all cases*, 2 = *medically legal*, 3 = *recreationally legal*).

2.4.4. Informational sources

Using a 10-item checklist adapted from a survey that Carlini et al. (2017) developed, providers selected all the sources that they use to learn about cannabis, including “other”. We created a total count of information sources for analytic purposes as well as a count of formal (peer-reviewed research articles, lectures, continuing education, legal counsel, and practice administrators) and informal sources (news media, patients, friends/family, and dispensary owners).

2.4.5. Level of training

The study assessed level of training regarding substance use in two ways. First, using a 4-item training experiences scale, providers rated how much general substance use training they received prior to their employment, in graduate school, in their current position, and their overall basic knowledge. Ratings used a 5-point Likert scale (1 = *none*, 2 = *a little*, 3 = *a moderate amount*, 4 = *a great deal*, 5 = *expert level*). Averaging scores created a scale across experience items with higher scores indicating more training. The total training experiences scale reliability was acceptable (Cronbach's $\alpha = 0.76$).

Second, using a 6-item scale, providers rated their knowledge of alcohol and cannabis on the same 5-point Likert scale. The study used three items each for cannabis and alcohol to assess provider training knowledge related to understanding the effects, side effects, and interactions with medications. The study team calculated mean average scores for alcohol and cannabis items with higher scores indicating greater knowledge. The reliability of the scales was good (cannabis knowledge: Cronbach's $\alpha = 0.88$; alcohol knowledge: Cronbach's $\alpha = 0.89$).

2.4.6. Assessment preparation and confidence

Providers reported whether they routinely asked their clients about whether they had a prescription for cannabis (0 = *no*, 1 = *yes*). Participants selected from a 5-point scale the percentage of their clients with a prescription for cannabis (0 = 0%, 1 = 25% or less, 2 = 26–50%, 3 = 51–75%, 4 = 76–100%) for descriptive purposes.

Providers also rated their confidence for assessing aspects of their clients' cannabis (5 items) or alcohol use (4 items) on a 5-point Likert-type scale (1 = *not at all*, 2 = *rarely*, 3 = *in some cases*, 4 = *in many*

Table 1
Sample demographics and training experiences by state and total.

| Demographics | Total (N = 717) n (%) | California (N = 410) n (%) | Ohio (N = 214) n (%) | New York (N = 93) n (%) | χ^2 | p |
|--|-----------------------------|----------------------------------|----------------------------|-------------------------------|----------------------|------------------|
| Gender | | | | | 5.805 | .055 |
| Male | 171 (23.8%) | 105 (25.6%) | 39 (18.2%) | 27 (29.0%) | | |
| Female | 540 (75.3%) | 302 (73.7%) | 173 (80.8%) | 65 (69.9%) | | |
| Unknown | 6 (0.8%) | 3 (0.7%) | 2 (0.9%) | 1 (1.1%) | | |
| Race/ethnicity | | | | | 132.750 ¹ | <.001 |
| White | 378 (52.7%) | 144 (35.1%) | 163 (76.2%) | 71 (76.3%) | | |
| LatinX | 166 (23.2%) | 158 (38.5%) | 4 (1.9%) | 4 (4.3%) | | |
| African American | 71 (9.9%) | 35 (8.5%) | 25 (11.71%) | 11 (11.8%) | | |
| Asian/Pacific Islander | 53 (7.4%) | 46 (11.2%) | 5 (2.3%) | 2 (2.2%) | | |
| Other | 37 (5.2%) | 26 (6.3%) | 9 (4.2%) | 2 (2.2%) | | |
| Age category | | | | | 5.310 | .257 |
| 20–35 years old | 335 (46.7%) | 195 (47.6%) | 97 (45.3%) | 43 (46.2%) | | |
| 36–50 years old | 207 (28.8%) | 127 (31.0%) | 58 (27.1%) | 22 (23.7%) | | |
| 51–56+ years old | 173 (24.1%) | 87 (21.2%) | 59 (27.6%) | 27 (29.0%) | | |
| Years practicing in mental health | | | | | 22.758 | .004 |
| 0 to 5 years | 307 (42.8%) | 193 (47.1%) | 78 (36.4%) | 36 (38.7%) | | |
| 6 to 10 years | 161 (22.5%) | 87 (21.2%) | 55 (25.7%) | 19 (20.4%) | | |
| 11 to 15 years | 85 (11.9%) | 50 (12.2%) | 30 (14.0%) | 5 (5.4%) | | |
| 16 to 20 years | 57 (7.9%) | 36 (8.8%) | 11 (5.1%) | 10 (10.8%) | | |
| 21+ years | 96 (13.4%) | 40 (9.8%) | 38 (17.8%) | 18 (19.4%) | | |
| Provider type | | | | | 55.429 | <.001 |
| Licensed | 132 (18.4%) | 47 (11.5%) | 75 (35.0%) | 10 (10.8%) | | |
| Unlicensed | 581 (81.0%) | 360 (87.8%) | 139 (65.0%) | 82 (88.2%) | | |
| Provider role ² | | | | | 76.869 | <.001 |
| Psychiatrist | 104 (14.5%) | 56 (13.7%) | 33 (15.4%) | 15 (16.1%) | | |
| Psychologist | 30 (4.2%) | 28 (6.8%) | 0 (0%) | 2 (2.2%) | | |
| Medical staff (nurses, physician's assistant) | 79 (11%) | 28 (6.8%) | 41 (19.2%) | 10 (10.8%) | | |
| Marriage and family therapist, licensed clinical social worker, and clinical social worker | 285 (39.7%) | 194 (47.3%) | 60 (28%) | 31 (33.3%) | | |
| Case worker, mental health worker, counselor, specialists, and coordinators | 169 (23.6%) | 69 (16.8%) | 71 (33.2%) | 29 (31.2%) | | |
| Peer partner | 28 (3.9%) | 22 (5.4%) | 2 (0.9%) | 4 (4.3%) | | |
| Other/unknown | 22 (3.1%) | 13 (3.2%) | 7 (3.3%) | 2 (2.2%) | | |
| Geographic region | | | | | 53.526 | <.001 |
| Urban | 426 (59.4%) | 273 (66.6%) | 90 (42.1%) | 62 (66.7%) | | |
| Suburban | 236 (32.9%) | 118 (28.8%) | 100 (46.7%) | 18 (19.4%) | | |
| Rural | 45 (6.3%) | 12 (2.9%) | 20 (9.3%) | 13 (14.0%) | | |
| Training experiences ³ | M (SD) | M (SD) | M (SD) | M (SD) | F | p (η_p^2) |
| Training prior to employment ^{A,B} | 2.83 (1.05) ³ | 2.66 (1.03) | 3.06 (1.05) | 3.09 (1.02) | 8.554 | <.001 (.023) |
| Grad school training ^C | 2.44 (1.14) | 2.37 (1.08) | 2.43 (1.19) | 2.75 (1.20) | 4.610 | .010 (.014) |
| In current position ^{A,B} | 2.60 (1.10) | 2.34 (1.06) | 2.90 (1.10) | 3.06 (1.00) | 20.922 | <.001 (.058) |
| Feel prepared ^{A,B} | 2.98 (1.06) | 2.73 (1.05) | 3.29 (1.01) | 3.37 (0.91) | 20.992 | <.001 (.058) |
| Total training experiences ^{A,B} | 2.71 (0.83) | 2.52 (0.79) | 2.93 (0.83) | 3.07 (0.78) | 20.191 | <.001 (.056) |

Note: Differences from total N in each column reflect missing information and percentages are from the full totals.

¹ Due to the extremely low counts in certain ethnicity categories across between states, race/ethnicity were re-categorized after into White and Non-White for between-state comparisons.

² Provider roles were collapsed into smaller categories where roles overlapped. A total of 153 (21.5%) providers selected multiple roles. For presentation, these roles were recoded into the positions with the highest level of educational/professional attainment. For example, if a person selected Clinical Social Worker and Psychologist, they were recoded as Psychologist.

³ Training experience items were scaled from 1 = none to 5 = expert level. ANCOVAs were conducted to test differences in states for each training experience controlling years practicing (0–5 years vs. 6+ years), providers type (licensed vs. unlicensed), and geographic region (urban vs. non-urban). Bonferroni post hoc analysis comparisons were adjusted for multiple comparisons only p values of <.01 were interpreted as significant. The following notation was used for statistically significant differences found in post hoc analysis:

^A California v. Ohio.

^B California v. New York.

^C Ohio v. New York.

cases, 5 = in most cases). Providers rated their confidence of knowing when clients used each substance, the quantity used, chart accuracy for the substance, and client readiness for reducing or abstaining from each substance. For cannabis, staff also rated their knowledge of the types of cannabis clients used (edibles, oils, waxes, etc.). The study calculated mean average scores for assessment confidence for alcohol only items and cannabis only items with higher scores indicating greater confidence. The reliability of the scales was good (cannabis assessment confidence: Cronbach's $\alpha = 0.86$; alcohol assessment confidence: Cronbach's $\alpha = 0.81$).

2.4.7. Comfort with and frequency of substance use discussions

Providers rated the extent to which they felt comfortable discussing and how frequently they discussed general substance use, alcohol, and cannabis issues with their clients on a 5-point Likert-type scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often). The study calculated three, 2-item mean scores that represented comfort with and frequency of discussions of cannabis, alcohol, and general substance use with clients, with higher scores indicating greater comfort and frequency of discussions (2 items for each substance type). The reliability of these scales was acceptable (cannabis: Cronbach's $\alpha = 0.73$; alcohol: Cronbach's $\alpha = 0.77$; general substance use: Cronbach's $\alpha = 0.78$).

2.4.8. Treatment perceptions and behaviors

Due to perceptions by the PBRN members that treatment referrals for cannabis alone do not occur, providers rated the frequency that they refer someone for general substance use or alcohol treatment and how often they think clients use those referrals. Then providers rated how often they thought treatment is effective for general substance use, alcohol use, and cannabis use on a 5-point Likert-type scale (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *very often*). All responses are single item measures addressing each domain for the three substance use categories.

2.5. Plan of analysis

The study team assessed all variables for their distributions. Using paired-sample *t*-tests, the study team compared the differences among general substance use, cannabis, and alcohol variables. We conducted correlation analyses to examine relationships between scales and items. The research team conducted between-state comparisons using Chi-square and analysis of covariance (ANCOVA) as appropriate. Between-state ANCOVA comparisons compared providers' self-assessed knowledge, comfort discussing and assessing substance use, and likelihood of providing treatment referrals, while controlling for providers' licensure status (licensed v. unlicensed), years of experience practicing mental health treatment (0–5 years v. 6 or more years), and whether they were providing services in an urban setting (urban v. nonurban). Distributions of composite scores and items largely met the assumption of normality and homogeneity of variance (Levine's test assumption met for all variables). All post hoc tests are Bonferroni and the threshold for significance adjusted for multiple comparisons ($p < .01$). Finally, using the R package MeMoBootR (Buchanan, 2018), path analyses with categorical predictors tested between state-level differences in confidence, behaviors, and perceptions with training knowledge as a mediator. This R package mirrors the framework of SPSS's PROCESS (Hayes, 2018) and is mathematically equivalent to an analysis of covariance (ANCOVA) while allowing for mediation analysis with a multi-categorical independent variable. A significant Sobel's test with a 95% CI that does not include zero indicates full mediation. Each model had an adequate case-to-parameter ratio and passed assumption checks.

3. Results

3.1. Sample

A total of 717 providers responded to the survey, 410 from California, 214 from Ohio, and 93 from New York. Table 1 presents the demographics of participants from each state and the total. Overall, providers were largely female (75.3%, $n = 540$), White (52.7%, $n = 378$), unlicensed (81.0%, $n = 581$), practiced in urban regions (59.4%, $n = 426$), and had been in mental health care for 5 years or fewer (42.8%, $n = 307$). Marriage and family therapists, licensed clinical social workers, or clinical social workers (39.7%, $n = 285$) composed the largest position group, followed by case workers, mental health workers, counselors, specialist, or coordinators (23.6%, $n = 169$). Providers across states were relatively similar in terms of gender, age, years in mental health practice, and geographic region, with California having less experienced and fewer rural area providers. Providers from Ohio (76.2%, $n = 163$) and New York (76.3%, $n = 71$) were significantly more likely to be White compared to providers in California (35.1%, $n = 144$; $p < .001$). Ohio (35.0%, $n = 75$) had more licensed providers compared to California (11.5%, $n = 47$) and New York (10.8%, $n = 10$; $\chi^2(2,713) = 55.429$, $p < .001$). California's participants included more marriage and family therapists, licensed clinical social workers, or clinical social workers (47.3%, $n = 194$) compared to Ohio (28%, $n = 60$) and New York (33.3%, $n = 31$).

3.2. Substance use treatment

Providers reported whether their agencies provided substance use services and identified effective treatment modalities. The vast majority of providers reported that their agency provided substance use services (82.6%, $n = 592$). The most commonly endorsed models (see Fig. 1) included group therapy (82.3%, $n = 590$) motivational interviewing (81.0%, $n = 581$), and harm reduction (78.1%, $n = 560$); and brief cognitive therapy was the least endorsed (53.3%, $n = 382$).

In between-state comparisons, providers in California reported offering substance use treatment less often (76.8%, $n = 315$) compared to providers in Ohio (91.1%, $n = 195$) and New York (88.1%, $n = 82$), $\chi^2(2,709) = 22.525$, $p < .001$. Perceived treatment efficacy differed substantially among states. Specifically, providers from Ohio endorsed group therapy ($p < .001$), brief cognitive therapy ($p < .001$), and medication for addiction treatment ($p < .001$) more often than did those in other states. Views on effectiveness of the 12-step program also differed among states, $\chi^2(2,715) = 34.902$, $p < .001$. Fewer New York providers (51.6%, $n = 48$) felt it was effective compared to those in Ohio (82.7%, $n = 177$) and California (76.8%, $n = 315$).

Providers identified barriers to substance use treatment for their clients with SMI (see Fig. 2). Overall, providers noted an average of 4.50 barriers ($SD = 2.45$), but no differences emerged in the number of barriers noted among the states when controlling providers' licensure status, years of experience, and service setting, $F(5,686) = 3.728$, $p = .025$. A lack of client recognition that substance use is an issue was the most commonly endorsed, with nearly three-fourths ($n = 535$) of all providers endorsing it as a barrier. Other highly endorsed barriers included limited availability of services, cost, and wait/delays in admission.

In terms of differences among states, providers from New York (29%, $n = 27$) perceived cost as an issue less often than did providers in California (61.7%, $n = 253$) or Ohio (57.9%, $n = 124$; $\chi^2[2,717] = 33.220$, $p < .001$). While the majority of providers identified wait/delays in admission, Ohio providers endorsed it most frequently (68.7%, $n = 147$) and significantly more often than those in New York (59.1%, $n = 55$) and California (51.2%, $n = 210$; $\chi^2[2,717] = 17.684$, $p < .001$). More providers in California (22.9%, $n = 94$) thought of substance use treatment as beyond their scope of practice compared to providers in Ohio (14%, $n = 214$) and New York (6.5%, $n = 6$; $\chi^2[2,717] = 17.337$, $p < .001$). However, this barrier was one of the least endorsed.

3.3. Awareness of legal status

At the time of the survey, cannabis was medically legal only in Ohio (though dispensaries were not yet open) and New York (dispensaries were open) and it had just become recreationally legal in California, though no dispensaries were authorized to sell for recreational purposes yet (Lombardi et al., 2020; Marchini & Parino, 2016; Mitra & Virani, 2019). Providers could select whether cannabis was totally illegal, legal for medical purposes only, and/or recreationally legal in their state. The majority of providers in Ohio (77.6%, $n = 166$) and New York (87.1%, $n = 81$) correctly identified it as medically legal in their states and not recreationally legal (96.7% in Ohio and 97.8% in New York). In California, most providers (75.1%, $n = 308$) correctly indicated that cannabis was legal for recreational purposes. However, a small proportion in each state (12.9% of providers in New York; 16.1% in California, and 19.6% in Ohio) selected that it was illegal in all cases, which may reflect confusion between federal and state policy.

3.4. Informational sources

To understand how providers learn about cannabis's effects, providers identified all the types of information sources they use. Overall, a majority learned from continuing education (61.2%, $n = 439$), patients (60.7%, $n = 435$), news media (60.4%, $n = 433$), and peer-reviewed

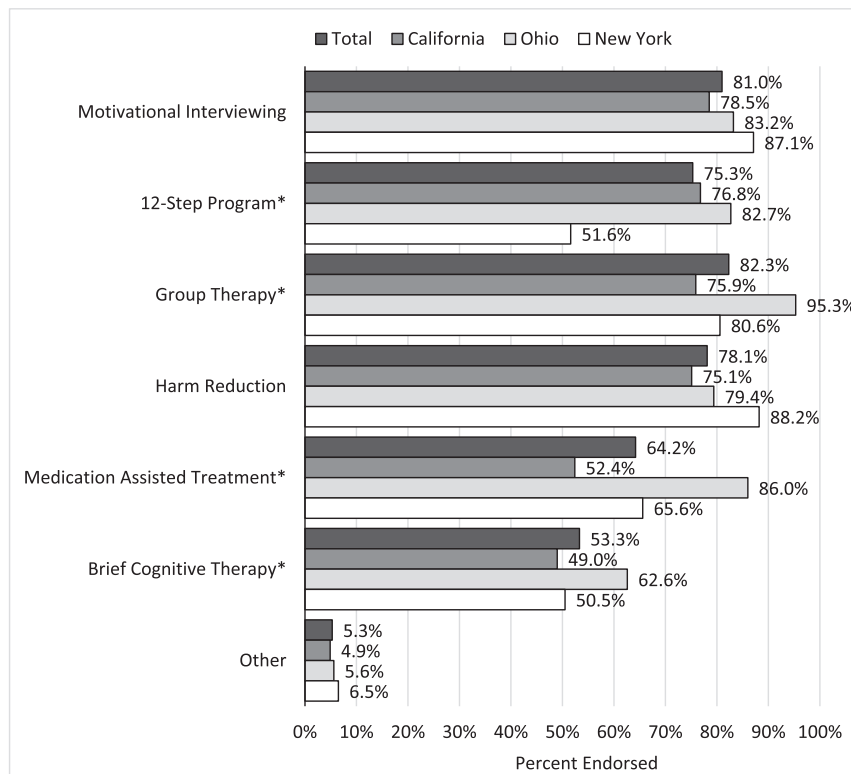


Fig. 1. Total and between-state chi-square comparisons of substance use treatment models perceived effectiveness.

Note. The figure displays the percent of endorsement by state and total. Analyses are completed with Chi-square comparisons and significance evaluated at $p < .01$ (*). Analyses were also conducted as logistic regressions to control for licensure, years of practice, and geographic area and there were no differences in the between-state comparisons. Chi-squares are presented for ease of interpretation.

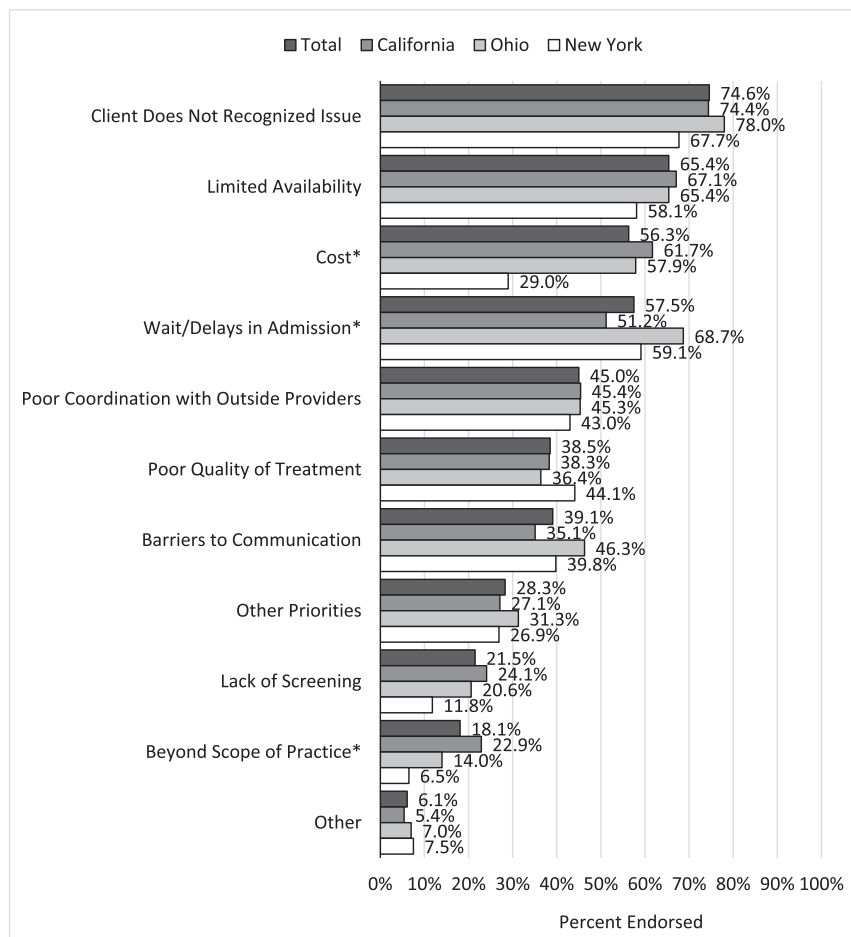


Fig. 2. Total and between-state comparisons of barriers to general substance use treatment for clients with SMI.

Note. The figure displays the percent of endorsement by state and total. Analyses are completed with Chi-square comparisons and significance evaluated at $p < .01$ (*). Analyses were also completed as logistic regressions, controlling for licensure, years of experience, and geographic region and two additional barriers reached significance. While controlling for provider characteristics, providers in California felt the lack of screening was a common barrier to treatment more than those in New York ($p = .0096$) and providers in Ohio felt that communication with substance use providers was a more common barrier than those in California, $p = .004$.

research (59.3%, $n = 425$); and they used an average of 3.75 different sources ($SD = 1.66$). Using Chi-square comparisons, we tested for differences in proportions of endorsement by state (see Fig. 3). California providers often relied on friends and family for information (59%; $n = 242$), whereas only 47.7% ($n = 102$) of Ohio providers and 39.8% ($n = 37$) of New York providers did ($p < .001$). Continuing education and peer-reviewed research articles were main informational sources for Ohio (70.6% and 66.4% respectively) and New York (69.9% and 66.7% respectively), while slightly more than half of providers in California listed each ($p < .001$).

While no between-state differences occurred for the number of sources referred to when controlling for provider characteristics ($F[5,686] = 0.157, p = .945$), important differences existed in the quality of sources used. After dividing sources of information into formal sources (peer-reviewed research articles, lectures, continuing education, legal counsel, and practice administrators) and informal sources (news media, patients, friends/family, and dispensary owners), the team conducted one-way ANCOVA comparisons between states for each grouping. Among states, there were significant differences in the use of formal sources when controlling for provider characteristics, $F(5,686) = 5.121, p = .006, \eta_p^2 = 0.015$. Providers in California ($M = 1.75, SD = 1.13$) used significantly fewer formal sources compared to providers in Ohio ($M = 2.07, SD = 1.23$; Bonferroni post hoc comparisons) but did not differ from providers in New York ($M = 2.01, SD = 1.08$). Between-state differences were also found for informal sources, $F(5, 686) = 5.077, p = .006, \eta_p^2 = 0.015$. Post hoc comparisons indicated that providers in California ($M = 1.94, SD = 1.06$) tended to rely on a greater number of informal sources compared to providers in Ohio ($M = 1.63, SD = 1.16$) but not significantly more than providers in New York ($M = 1.72, SD = 1.10$).

3.5. Level of training

The study assessed different levels of training experience for substance use overall and across states, while controlling for provider characteristics (see Table 1). Overall, providers had a moderate level of training experiences ($M = 2.71, SD = 0.83$). Between states, these total training experiences significantly differed ($p < .001, \eta_p^2 = 0.056$). In post hoc comparisons, California ($M = 2.52, SD = 0.79$) providers received less total training than those in Ohio ($M = 2.93, SD = 0.83$) and New York ($M = 3.07, SD = 0.78$; the study found no differences between New York and Ohio). It is important to note that while New York had the highest level of training, New York's average score of 3.07 still indicated that they only received a moderate amount of training to address clients' substance use.

In examining different types of training experiences, controlling for provider characteristics, the degree to which providers completed training during graduate school did not significantly differ among states. Overall, providers felt they had a *little to a moderate amount* of knowledge from graduate school training ($M = 2.44, SD = 1.14$). Training in their current position was slightly better but still low ($M = 2.60, SD = 1.14$). The study found differences among states in training received in the current position ($p < .001, \eta_p^2 = 0.058$). Post hoc comparisons indicated that providers in California ($M = 2.34, SD = 1.06$) received less training in their current position than did those in Ohio ($M = 2.90, SD = 1.10$) and New York ($M = 3.06, SD = 1.00$; the study found no differences between New York and Ohio). Providers also only felt moderately prepared to treat substance use on average based on their training experiences, and the study found significant differences among states ($p < .001, \eta_p^2 = 0.058$). Providers in California ($M = 2.73, SD = 1.05$) felt less prepared compared to providers in both Ohio ($M = 3.29, SD = 1.01$) and New York ($M = 3.37, SD = 0.91$; the study found no

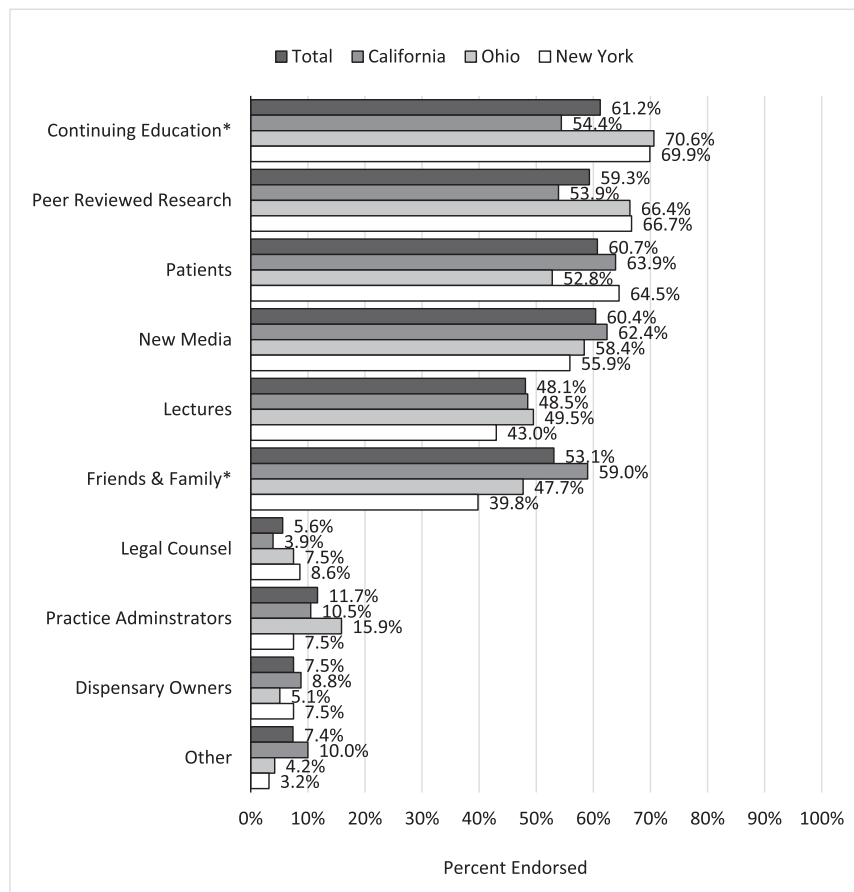


Fig. 3. Total and between-state comparisons of sources of information about cannabis among behavioral health providers.

Note. The figure displays the percent of endorsement by state and total. Analyses are completed with Chi-square comparisons and significance evaluated at $p < .01$ (*). Analyses were also conducted as logistic regressions and two additional between-state comparisons became significant. While controlling for provider characteristics (licensure, years of experience, geographic region), providers in Ohio relied on peer reviewed research articles more ($p = .004$) and information from patients less ($p = .002$) than those in California.

differences between New York and Ohio).

3.6. Associations of training and substance use practices

Using a series of correlation tests, we explored how training experiences may relate to providers' confidence and comfort with substance use issues (see Table 2). All the variables had significant positive relationships with each other and the study found slightly stronger relationships between the corresponding substance training and behaviors (e.g., cannabis items had stronger relationships with other items about cannabis than alcohol or general substance use). Importantly, training experiences shared similarly strong associations with assessments, perceptions, and behaviors for both general and specific substances, as did the substance-specific training knowledge measures, which suggests that any training regarding substance use can help providers to feel better prepared to address their clients' substance use.

3.7. Knowledge

The study also assessed training knowledge regarding cannabis and alcohol use. Table 3 presents state-by-state comparisons and ANCOVA results. Providers felt moderately knowledgeable about cannabis treatment ($M = 2.81$) but felt significantly more knowledgeable about alcohol treatment ($M = 3.27$) in a paired t -test ($t[702] = -20.507, p < .001, d = 0.77$). Significant between-states differences existed regarding knowledge about cannabis treatment ($p < .001, \eta_p^2 = 0.051$) and alcohol treatment ($p < .001, \eta_p^2 = 0.086$). California providers ($M = 2.67$) felt significantly less knowledgeable about cannabis treatment compared to New York ($M = 3.28$), but not Ohio ($M = 2.88$). California providers ($M = 3.04$) also felt significantly less knowledgeable about alcohol treatment compared to both Ohio ($M = 3.54$) and New York providers ($M = 3.68$). The study found no differences between New York and Ohio providers on either measure.

Overall, the results indicated that providers' training experiences and knowledge were middling, and that California lagged behind Ohio and

New York in several domains with small-to-medium effect sizes. Additionally, providers reported significantly greater weaknesses in their preparation to address cannabis use in treatment than alcohol use.

3.8. Assessment confidence

The study examined confidence in assessing substance use overall and between states. Across the full sample, providers were mostly confident in their abilities to assess alcohol ($M = 3.39, SD = 0.78$) but significantly less confident about assessing cannabis use ($M = 3.08, SD = 0.8$) in a paired t -test ($t(684) = -16.576, p < .001, d = 0.63$).

In between-state comparisons controlling for provider factors (see Table 3), California providers felt significantly less confident assessing cannabis use and alcohol use in clients than providers in New York only, but not different than those in Ohio. Providers in New York and Ohio did not differ on cannabis or alcohol assessment confidence. Overall, providers indicated confidence in assessing use by some (but not many) of their clients, though between-state differences were small, and their confidence was weakest regarding cannabis.

3.9. Comfort with and frequency of substance use discussions

The study also examined providers' comfort with and frequency of discussions with clients about substance use across the full sample. On average, providers were comfortable and often discussed general substance use with their clients ($M = 3.97, SD = 0.82$). As research found in other domains, in a series of paired t -tests, comfort and frequency of discussions were significantly higher with alcohol ($t(665) = -7.342, p < .001, d = 0.28$), and general substance use ($t(665) = -8.946, p < .001, d = 0.35$) compared to cannabis. The study found no differences between alcohol use and general substance use ($p = .53$).

Controlling for provider and regional factors, significant between-state differences existed for providers' comfort with and the frequency that they held conversations with clients about cannabis use, alcohol use, and general substance use (see Table 3). California providers were

Table 2

Correlations between training experiences, training knowledge, assessment confidence, frequency and comfort discussing substance use, referral use, and treatment efficacy.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 Training experiences | | | | | | | | | | | | | | |
| Training knowledge | | | | | | | | | | | | | | |
| 2 Cannabis knowledge | 0.567* | | | | | | | | | | | | | |
| 3 Alcohol knowledge | 0.600* | 0.760* | | | | | | | | | | | | |
| Assessment confidence | | | | | | | | | | | | | | |
| 4 Cannabis assessment | 0.458* | 0.551* | 0.506* | | | | | | | | | | | |
| 5 Alcohol assessment | 0.456* | 0.486* | 0.553* | 0.818* | | | | | | | | | | |
| Comfort and frequency discussing with clients | | | | | | | | | | | | | | |
| 6 Cannabis use | 0.501* | 0.481* | 0.478* | 0.506* | 0.474* | | | | | | | | | |
| 7 Alcohol use | 0.525* | 0.429* | 0.504* | 0.461* | 0.538* | 0.869* | | | | | | | | |
| 8 General substance use | 0.523* | 0.447* | 0.498* | 0.500* | 0.531* | 0.902* | 0.943* | | | | | | | |
| Refer to treatment | | | | | | | | | | | | | | |
| 9 Alcohol use | 0.376* | 0.303* | 0.408* | 0.272* | 0.375* | 0.451* | 0.535* | 0.511* | | | | | | |
| 10 General substance use | 0.402* | 0.327* | 0.423* | 0.322* | 0.362* | 0.501* | 0.546* | 0.549* | 0.788* | | | | | |
| Use of referral | | | | | | | | | | | | | | |
| 11 Alcohol use | 0.308* | 0.299* | 0.345* | 0.265* | 0.328* | 0.340* | 0.390* | 0.383* | 0.691* | 0.593* | | | | |
| 12 General substance use | 0.339* | 0.290* | 0.351* | 0.327* | 0.339* | 0.356* | 0.391* | 0.406* | 0.566* | 0.636* | 0.745* | | | |
| Treatment effectiveness | | | | | | | | | | | | | | |
| 13 Cannabis use | 0.217* | 0.294* | 0.256* | 0.254* | 0.223* | 0.242* | 0.195* | 0.228* | 0.241* | 0.228* | 0.336* | 0.318* | | |
| 14 Alcohol use | 0.226* | 0.251* | 0.297* | 0.266* | 0.294* | 0.293* | 0.311* | 0.306* | 0.367* | 0.309* | 0.456* | 0.377* | 0.608* | |
| 15 General substance use | 0.249* | 0.268* | 0.334* | 0.288* | 0.282* | 0.336* | 0.341* | 0.347* | 0.324* | 0.317* | 0.403* | 0.394* | 0.705* | 0.719* |

* $p < .01$.

Table 3

Provider ratings of training knowledge, intervention activities, and treatment perceptions by state.

| | Total | | State | | | | | | <i>F</i> | <i>p</i> | η_p^2 |
|---|----------|-----------|------------|-----------|----------|-----------|----------|-----------|----------|----------|------------|
| | | | California | | Ohio | | New York | | | | |
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | | |
| <hr/> | | | | | | | | | | | |
| Training knowledge | | | | | | | | | | | |
| Cannabis knowledge ^B | 2.81 | 0.87 | 2.67 | 0.87 | 2.88 | 0.84 | 3.28 | 0.73 | 18.128 | <.001 | 0.051 |
| Alcohol knowledge ^{AB} | 3.27 | 0.86 | 3.04 | 0.88 | 3.54 | 0.78 | 3.68 | 0.60 | 31.594 | <.001 | 0.086 |
| Assessment confidence | | | | | | | | | | | |
| Cannabis assessment ^B | 3.09 | 0.82 | 2.99 | 0.86 | 3.17 | 0.78 | 3.33 | 0.67 | 5.455 | .004 | 0.016 |
| Alcohol assessment ^B | 3.39 | 0.76 | 3.28 | 0.80 | 3.51 | 0.70 | 3.59 | 0.65 | 5.567 | .003 | 0.018 |
| Comfort and frequency discussing with clients | | | | | | | | | | | |
| Cannabis use ^B | 3.86 | 0.82 | 3.72 | 0.81 | 3.99 | 0.82 | 4.19 | 0.69 | 12.685 | <.001 | 0.038 |
| Alcohol use ^{AB} | 3.97 | 0.80 | 3.81 | 0.80 | 4.15 | 0.78 | 4.25 | 0.70 | 14.460 | <.001 | 0.043 |
| General substance use ^{AB} | 3.98 | 0.80 | 3.82 | 0.80 | 4.16 | 0.75 | 4.28 | 0.70 | 15.767 | <.001 | 0.053 |
| Refer to treatment | | | | | | | | | | | |
| Alcohol use ^A | 2.89 | 1.15 | 2.67 | 1.16 | 3.32 | 1.11 | 2.91 | 0.90 | 17.850 | <.001 | 0.055 |
| General substance use ^{AB} | 3.04 | 1.15 | 2.76 | 1.13 | 3.49 | 1.12 | 3.21 | 0.91 | 22.707 | <.001 | 0.067 |
| Use of referral | | | | | | | | | | | |
| Alcohol use ^A | 2.63 | 0.96 | 2.40 | 0.95 | 3.03 | 0.91 | 2.73 | 0.84 | 22.913 | <.001 | 0.067 |
| General substance use ^{AB} | 2.66 | 0.96 | 2.43 | 0.96 | 3.04 | 0.90 | 2.79 | 0.78 | 22.925 | <.001 | 0.067 |
| Treatment effectiveness | | | | | | | | | | | |
| Cannabis use | 2.92 | 0.84 | 2.97 | 0.82 | 2.88 | 0.89 | 2.75 | 0.76 | 2.609 | .074 | 0.008 |
| Alcohol use | 3.19 | 0.84 | 3.16 | 0.87 | 3.31 | 0.85 | 3.04 | 0.68 | 3.985 | .019 | 0.012 |
| General substance use | 3.20 | 0.77 | 3.16 | 0.75 | 3.36 | 0.82 | 2.99 | 0.68 | 6.643 | <.001 | 0.020 |

Note: Cannabis knowledge and alcohol knowledge were a composite training knowledge items that were scaled from 1 to 5 (none, a little, a moderate amount, a great deal, expert level). Cannabis assessment and alcohol assessment were a composite assessment confidence items scaled from 1 to 5 (not at all, rarely, in some cases, in many cases, in most cases). Comfort and frequency discussing with clients, refer to treatment, use of referrals, and treatment effectiveness were scaled from 1 to 5 (never, rarely, sometimes, often, very often). Composite scores for comfort and frequency discussing with clients were averaged across items and ranged from 1 to 5. ANCOVAs were conducted to test differences in States for each factor controlling for years practicing (0–5 years vs. 6+ years), Providers type (licensed vs. unlicensed), and geographic region (urban vs. non-urban). Post hoc analysis was conducted for multiple comparisons between states using a Bonferroni adjustment. Only $p < .01$ were evaluated. The following notation was used for statistically significant differences found in post hoc analysis: ^ACalifornia v. Ohio, ^BCalifornia v. New York, ^COhio v. New York.

less likely to be comfortable and had less frequent conversations with clients about cannabis ($p < .001$), alcohol ($p < .001$), and general substance use ($p < .001$) than those in New York. Additionally, California providers differed from Ohio providers related to general substance use. No differences existed between providers in Ohio and New York on any of the comparisons. The effect sizes of these differences, however, were small (ranging from $\eta_p^2 = 0.038$ to $\eta_p^2 = 0.053$).

3.10. Treatment perceptions and behaviors

Table 3 presents comparisons of providers' tendency to refer, and their perceptions of how often referrals led to treatment and of treatment effectiveness overall and among states. Due to PBRN members' perceptions that referrals for substance use treatment for cannabis use alone were extremely rare, the study assessed referrals to general substance use and alcohol only (though we examined treatment efficacy for all three substance groups). Providers sometimes provided referrals for general substance use treatment ($M = 3.03$, $SD = 1.16$) and provided referrals for alcohol treatment less frequently ($M = 2.89$, $SD = 1.16$; $t[651] = 4.678$, $p < .001$, $d = 0.18$). Providers, on average, did not think that clients typically used referrals for alcohol or general substance use treatment ($t[654] = 0.906$, $p = .365$). On average, providers felt that treatment was only sometimes effective and that cannabis treatment was less effective than treatment for alcohol use ($t[656] = -9.151$, $p < .001$, $d = 0.36$) and general substance use ($t[658] = -11.695$, $p < .001$, $d = 0.46$). No difference existed in perceptions of effectiveness between alcohol and general substance use ($p = .49$).

Key patterns existed in how providers perceived the usefulness of treatment referrals, even after controlling for other provider and regional factors (see Table 3). California providers were significantly less likely to refer their clients to general substance use treatment and alcohol treatment than those in Ohio ($p < .001$). The study found no

differences in the rates of referral between Ohio and New York providers. In part, the lower rates of offering referrals may be related to providers' thought of how likely clients were to use those referrals, as California providers, compared to Ohio providers, thought clients were significantly less likely to use referrals for substance use or alcohol use treatment ($p < .001$). California providers were also less likely to think clients used referrals for general substance use as compared to providers in New York. Interestingly, no between-state differences existed for perceived effectiveness of alcohol or cannabis treatments, which could suggest that these variations are not due to quality of substance use services available.

3.11. Mediation analysis

As the study observed significant between-state differences for providers' preparation and comfort around substance use issues, particularly between California and the other states, we thought it was important to assess whether those differences are due to the contexts within those states or if they reflect between-state differences in providers' levels of training. In a series of six path analyses with categorical predictors using the R package MeMoBootR (Buchanan, 2018), we tested whether training (M) mediated the relationships between states (D ; Indicator Contrasts can be seen in Fig. 4) and outcomes (Y). In the mediation analysis with a multi-categorical independent variable, the study treated the state variable as two dummy-coded factors, first comparing Ohio to California and then New York to California (California is coded as 0). The outcome variables (Y) differed for each model and included assessment confidence, comfort with and frequency of discussing substance use, referral to treatment, perceived use of referral, and perceived effectiveness of treatment with the corresponding substances (e.g., training for alcohol with alcohol outcomes, training for cannabis with cannabis outcomes). We did not include covariates in the

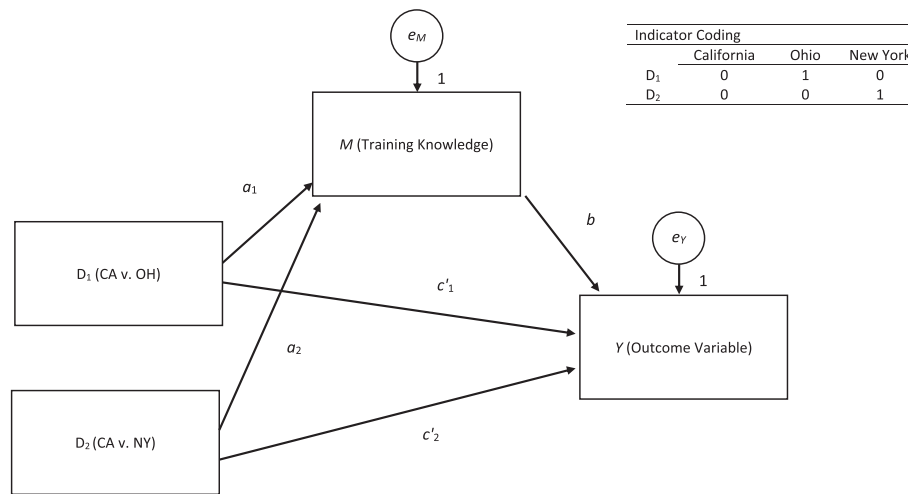


Fig. 4. Mediation model for state level differences in training knowledge and provider perceptions and behaviors.

Note. This figure displays the structure for the path model with multi-categorical predictors, included contrast coding for the between state comparison paths.

analysis, as ANCOVA results indicated that state-level differences existed when controlling for provider factors.

Table 4 presents the direct effect of states on the outcomes without the training knowledge (c_1 , c_2), the direct effect of state on training knowledge, (a_1 , a_2), the direct effect of training knowledge on the outcome (b), the effect of state on the outcomes with the mediator of training knowledge (c'_1 , c'_2), and the indirect effect (mediation) of training knowledge (M_1 , M_2). The direct effect of state all assessment confidence and comfort and frequency of discussion was significant and positive (c), which indicated that, similar to the ANCOVA results, New York and Ohio providers were significantly between California providers. The direct effect of state on treatment effectiveness did not differ, except for between California and Ohio on alcohol use treatment. The direct effect of training knowledge on all outcomes (without state effects) was significant and positive (b). These effects were quite large for assessment confidence as well as for the comfort and frequency of discussions, reiterating the strength of the impact of training knowledge on perceptions and behaviors. The direct effects of state on training

knowledge were significant and positive (a_1 and a_2) across all domains. These effects were large for Ohio and very large for providers in New York.

After including training as a mediator in these models, nearly all between-state differences disappeared and the study found full mediation for all the models. Mediation was strongest with assessment confidence, as after adding the mediator the effects were nearly zero. This mediation indicates that training knowledge differences across states completely explained all the state-level differences in assessment confidence and comfort and frequency of discussion for each substance. Moreover, Adjusted R^2 for the full models, as Table 4 shows, indicated that the model fit the data fairly well, but the addition of the mediator further improved the model fit. However, regarding treatment efficacy, one state difference remained. California providers were actually more likely to perceive cannabis use treatment as effective compared to those in New York when controlling for training knowledge. Additionally, Adjusted R^2 for the treatment efficacy models indicate a relatively poor fit and while it improved with the addition of the mediator, it was still

Table 4

Model results for training knowledge mediation of state level difference in provider perceptions and behaviors.

| | Direct effect of state on outcome | | Direct effect of training knowledge on outcome | Direct effect of state on training knowledge | | Effect of state on outcome with training knowledge | | Indirect effect of training knowledge (mediation) | | Adjusted R ² for full model |
|---|-----------------------------------|----------------|--|--|----------------|--|-----------------|---|-------------------------|--|
| | c ₁ | c ₂ | b | a ₁ | a ₂ | c' ₁ | c' ₂ | M ₁ (95% CI) | M ₂ (95% CI) | |
| Assessment confidence | | | | | | | | | | |
| Cannabis assessment | 0.218* | 0.372** | 0.527** | 0.243** | 0.593** | 0.090 | 0.059 | 0.128** (0.05, 0.21) | 0.312** (0.21, 0.41) | 0.310 |
| Alcohol assessment | 0.253* | 0.339** | 0.497** | 0.513** | 0.638** | −0.002 | 0.021 | 0.255** (0.18, 0.33) | 0.318** (0.24, 0.40) | 0.303 |
| Comfort and frequency discussing with clients | | | | | | | | | | |
| Cannabis use | 0.292** | 0.467** | 0.445** | 0.265** | 0.613** | 0.175* | 0.194 | 0.118** (0.05, 0.19) | 0.273** (0.18, 0.36) | 0.239 |
| Alcohol use | 0.346** | 0.445** | 0.452** | 0.529** | 0.654** | 0.107 | 0.149 | 0.239** (0.17, 0.31) | 0.296** (0.21, 0.38) | 0.256 |
| Treatment effectiveness | | | | | | | | | | |
| Cannabis use | −0.029 | −0.197 | 0.316** | 0.245* | 0.582** | −0.107 | −0.381** | 0.078** (0.03, 0.13) | 0.184** (0.10, 0.26) | 0.098 |
| Alcohol use | 0.209* | −0.103 | 0.318** | 0.517** | 0.637** | 0.045 | −0.305* | 0.164** (0.10, 0.23) | 0.203** (0.12, 0.28) | 0.099 |

Note: Models were conducted with their corresponding substance use training knowledge factor, e.g., assessment confidence for cannabis was mediated by cannabis training knowledge and assessment confidence for alcohol use was mediated by alcohol training knowledge. See Fig. 4 for overview of model structure and indicator coding (D_1 = CA v. OH, D_2 = CA v. NY). Indirect effect was evaluated through Sobel test and 95% confidence intervals for b .

* $p < .01$.

** $p < .001$.

low overall.

4. Discussion

Serious gaps persist in the implementation of training, programs, and interventions addressing substance use among individuals with serious mental illnesses in community mental health settings (Hartz et al., 2014). This study examined whether community-based mental health providers across three states felt adequately prepared to address cannabis use compared to alcohol or other substances. We found that providers overall felt less prepared to address cannabis use than alcohol use and that California providers felt relatively less prepared than Ohio and New York providers, even after controlling for licensure, years of experience, and urban vs nonurban setting. Importantly, training emerged as a significant mediator of providers' comfort assessing, discussing, and providing treatment referrals for alcohol and cannabis with their clients, such that inadequate substance use training largely accounted for the state-level differences. These findings suggest an urgent need to address national workforce training among mental health providers to improve services for individuals with co-occurring disorders.

Interestingly, some regional differences existed for perceived efficacy of treatment type and the sources of information used to learn about substance use issues. Ohio providers viewed group therapy, brief cognitive, and medication for addiction treatment to be significantly more effective than did providers in New York and California. Regional differences in attitudes toward treatment effectiveness could have implications for service provision, treatment effectiveness, and availability, and may reflect clients' attitudes and outcomes. Future research should explore these potentially important cultural differences. Providers in Ohio and New York were more likely to obtain cannabis-related information from formal sources such as continuing education lectures or peer-reviewed journals, while California providers were more likely to learn from informal sources such as clients or family/friends. Specifically, 71% of Ohio and 70% of New York providers learned about cannabis use from continuing educational opportunities, while only 54% of providers in California reported accessing training through this mechanism. Similarly, Ohio and New York providers reported accessing peer-reviewed research articles as a common source of information on cannabis use, whereas only 54% of California providers endorsed this source. In keeping with this pattern, California providers felt significantly less knowledgeable, felt less comfortable, and were less likely to talk with clients about cannabis, alcohol, and general substance use than providers in Ohio or New York. Furthermore, California providers more often viewed substance use treatment as beyond their scope of practice compared to providers in Ohio and New York.

Results from the ANCOVAs also indicated significant between-state differences related to providers' preparation and comfort around substance use issues. However, findings from mediation analyses suggest that these differences were most associated with heterogeneity of training among states. Training on alcohol and cannabis significantly mediated state-level differences for comfort assessing and discussing these substances, with one exception (Ohio vs. California for discussing cannabis); the between-state differences became nonsignificant after including training in the models. Taken together, these findings suggest that increasing access to formal training, and promotion of evidence-based sources of information to guide clinical decision-making in community mental health systems set the stage for providers to feel more confident addressing substance use, and to discuss use more frequently with clients. Last, while disparities in SUD training in general remain a problem, a larger differential is evident for cannabis specifically. Providers may be particularly reluctant to discuss cannabis use with clients compared to other types of substances. Given that access to and use of cannabis continue to increase and preliminary evidence suggests significant risks for individuals with SMI, treatment providers should allocate resources for training and dissemination of information about

the potential impact of cannabis.

4.1. Behavioral health provider training

Behavioral health staff members require adequate training, supervision, tools, and support to address the array of substances and levels of substance use among those with SMI (Petrakis et al., 2018), and the treatment of co-occurring disorders requires specialized training beyond treatment of either disorder alone. Unfortunately, training for substance use treatment is inconsistent and co-occurring substance use issues are often underdiagnosed and undertreated (Mueser, 2020). Our study results provide further evidence of these disparities. Mental health professionals often receive disparate and, at times, cursory training for co-occurring substance use (Mueser, 2020; Priester et al., 2016; Padwa et al., 2015), despite calls to standardize training for co-occurring disorders (Hughes, 2011). Many master's degree programs in mental health offer brief exposure to substance use and lack in-depth instruction in evidence-based practices to treat co-occurring disorders. Employers in mental health settings have an array of EBP that they require non-licensed and licensed staff to use; and training requires significant investments of time, resources, and energy from staff and agencies (Petrakis et al., 2018). Issues such as chronic turnover, limited time for training, competing treatment priorities, scope of practice issues, complex intervention protocols, lack of support for sustaining programs, and the misuse of non-evidence-based interventions can mean that agencies struggle to maintain a well-trained workforce. Thus, they may provide only basic substance use training (Brunette et al., 2008; Drake & Bond, 2010; Padwa et al., 2015).

This study also explored local system-level barriers that continue to challenge community-based mental health providers in their capacity to adequately assess, treat, and refer individuals with co-occurring disorders. On a system level, previous research has identified several barriers, such as a lack of service availability, under-identification of co-occurring issues, a lack of provider training, access issues, insurance and billing issues, and race/ethnicity disparities (Priester et al., 2016). Diagnostic and billing restrictions for mental health providers in the bifurcated mental health and substance use treatment systems can further interfere with treatment integration and training (Padwa et al., 2015). Results from the current investigation support such system-level and workforce barriers, as providers across all three states reported frequent obstacles to addressing substance use, including limited availability of substance use programs and services, prohibitive costs, delays in admission to such programs, and poor coordination with outside providers.

4.2. COVID-19

The stressors of the COVID-19 pandemic are likely to increase the severity and prevalence of co-occurring disorders, as individuals with SMI may lack the coping skills and resources to mitigate its impacts on their daily lives. Individuals with SMI have high rates of comorbid chronic health conditions, smoking or vaping of cannabis or tobacco products, social isolation, and are less likely to receive high quality health care that may make them more susceptible for severe symptoms and more adverse outcomes from COVID-19 (Volkow, 2020). Moreover, nationally, purchase rates of alcohol and cannabis increased during the pandemic (medical cannabis has essential service status in many states), which means that the availability of these substances are robust while other substances may be experiencing shortages due to disrupted access to international sources of those substances. The confluence of these issues increase the necessity to address the training gap identified in the current study and highlight that now is a critical period for increasing prevention and intervention efforts.

4.3. Limitations

This study used self-reported perceptions of providers' own

competencies and training rather than objective ratings, which can be subject to response bias. No national or state databases track the demographics of the mental health workforce for licensed or unlicensed staff. In recent national projections of the licensed behavioral health workforce new entrants are predominantly female (68%–88% across positions) and under the age of 30, which does reflect the gender and age distribution of our sample with <5 years of experience (Health Resources and Services Administration [HRSA], 2017). Additionally, in a 2018 report on the behavioral workforce of licensed providers, across positions, the majority in California are female and White (though this proportion decreases for positions requiring less education (Coffman et al., 2018)). However, the majority of our sample are unlicensed staff, which may be reflective of the treatment populations (given the number of peer and mental health providers), which in Los Angeles skew toward Latino and Black individuals. The PBRNs developed the study but New York did not have a PBRN from which to recruit, which may mean that the recruited samples have important differences. Further, we cannot determine the presence of systematic differences between those who received the survey link but did not respond to it and those who completed the survey (either partially or fully). Finally, mediation analyses provided insight into the relationship between level of training and outcome variables of interest cross-sectionally. However, to determine the degree to which training may lead to changes in attitudes and practice among community mental health providers in addressing substance use requires further testing of training interventions for similar providers. Still, results from this study extend and build upon knowledge about factors affecting community mental health providers' attitudes and behaviors toward addressing substance use, and ways in which these factors may vary among different geographic contexts and service systems.

4.4. Conclusions

Addressing substance use among individuals with SMI continues to be a national challenge for community mental health agencies. Training activities to educate mental health providers to detect and address the use of substances are critical to promote practices that can improve the quality of mental health services for those with serious mental illness. However, training for mental health providers is complex and unevenly provided. Despite awareness of the prevalence of substance use issues among those with SMI, providers under-implement treatment for co-occurring issues and a significant gap persists in substance use training.

Declaration of competing interest

None.

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