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Statewide Implementation of Cognitive Behavioral Therapy for Psychosis Through a Learning Collaborative Model

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Cognitive Behavioral Therapy for Psychosis (CBTp) is an evidence-based psychotherapeutic intervention (EBPI) for adults with schizophrenia spectrum disorders that remains under-implemented in the United States (U.S.). There has been little empirical attention on implementation and dissemination strategies for this EBPI. The Learning Collaborative (LC) model is a method of implementing evidence-based practices across agencies and geographic regions that may facilitate CBTp implementation and dissemination in the US. We applied the LC model in an attempt to enhance the accessibility of CBTp in community mental health settings statewide. Providers (N = 56) from 12 agencies voluntarily participated in an in-person, CBTp workshop followed by 6 months of biweekly phone-based consultation sessions (Phase 1). Twenty-one providers opted to participate in an additional 6-month CBTp LC immediately following completion of the initial CBTp LC (Phase 2). Adoption, penetration, provider-perceived skill development, fidelity, as well as provider-perceived implementation barriers were re-assessed during and 6 months after completion of Phase 2.

One year after the completion of the Phase 2 LC, 21% of the original trainee group across 3 of the 12 participating agencies continued to offer CBTp to clients. CBTp trainees were treating between one and two clients each. Self-assessed CBTp skills improved modestly over the Phase 2 consultation period. On average, both clinicians and supervisors reached an acceptable fidelity score on the sessions reviewed. Participating providers identified multiple barriers to CBTp implementation, including features of the training and consultation, the agency, the intervention itself, and psychosocial and clinical challenges associated with the client population.

Few CBTp implementation studies have applied a framework to CBTp implementation. The authors adapted the LC model in an attempt to promote adoption of CBTp in community mental health clinics across a large, populous state with poor access to mental health services. Identified challenges and recommendations should be considered in future implementation efforts.

Approximately 5 million Americans—or 1.5% of the population in the United States (U.S.)—have a schizophrenia spectrum diagnosis (Kessler et al., 2005). Despite the fact that fewer than half of all individuals with serious mental illnesses such as schizophrenia access mental health treatment of any kind (Wang, Demler, & Kessler, 2002), schizophrenia spectrum disorders account for more than $22 billion in direct, annual treatment costs (Wu et al., 2005). Cognitive Behavioral Therapy for Psychosis (CBTp) is an individualized psychotherapeutic intervention recommended as an adjunctive treatment for schizophrenia spectrum disorders (Dixon et al., 2010). The treatment includes the identification and modification of maladaptive thoughts and behaviors conceptualized as maintaining psychological distress associated with psychotic and related symptoms. Meta-analyses and systematic reviews vary in reported effect sizes for clinical symptoms and/or functioning, but the majority of these reviews have found small-to-moderate effects of CBTp compared to other interventions (Burns, Erickson, & Brenner, 2014; McDonagh et al., 2017; Sivec & Montesano, 2012; Turner, van der Gaag, Karyotaki, & Cuijpers, 2014; Wykes, Steel, Everitt, & Tarrier, 2008).

In 2005, Mueser and Noordsy called attention to the inaccessibility of CBTp in the U.S. in spite of mounting scientific evidence of its efficacy in reducing the distress and disability associated with psychotic symptoms. The authors issued a call to action to address the underavailability of this intervention through an increased commitment to train clinicians in CBTp. More than 10 years later, the estimated prevalence of trained CBTp providers amounted to only 0.1% of licensed clinicians in the U.S. (Mueser et al., 2015). The current mental health workforce consists of 296,656 mental health professionals (Heisler, 2018). Assuming that each CBTp-trained provider attempts to provide CBTp to

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the 5 million Americans with a nonaffective psychotic disorder, the roughly 300 CBTp-trained providers would each have a CBTp caseload of 16,852 individuals.

Implementation and dissemination efforts that foster clinician competence and treatment delivery are clearly needed to increase the availability of CBTp. Such efforts are often stymied by lack of available funding to support training and consultation, service delivery models that do not incorporate psychotherapy as the standard of care for clients with psychotic disorders, and insufficient empirical guidance concerning effective implementation strategies for evidence-based psychotherapeutic interventions (EBPIs) for individuals with schizophrenia spectrum disorders. These circumstances have contributed to a wide science-to-practice gap for CBTp (Kimhy et al., 2013; Shafran et al., 2009).

Implementation science developed within the last decade as a means of bridging the science-to-practice gap and addressing the empirical questions related to transferring evidence-based treatments into the public health system (Graham et al., 2006; McHugh & Barlow, 2010). To date, over 60 theoretical implementation frameworks and more than 70 implementation strategies have been published (Powell et al., 2015; Tabak, Khoong, Chambers, & Brownson, 2012). Whereas in-person training is effective in enhancing content knowledge of an evidence-based treatment, a training-only approach has not demonstrated effectiveness in changing provider behavior (Beidas, Edmunds, Marcus, & Kendall, 2012). The Breakthrough Series collaborative, developed by the Institute for Healthcare Improvement (2003), is a learning system that brings together multiple healthcare teams across geographic regions for an intensive, short-term (6 to 15 months) consultation period. These collaboratives seek to enhance dissemination efforts without sacrificing skill uptake by emphasizing the role of follow-up consultation in improving healthcare delivery (Ayers et al., 2005; Institute for Healthcare Improvement, 2003; Kilo, 1998; Nembhard, 2009).

Modeled after the Breakthrough Series, Learning Collaboratives (LCs) represent a type of quality-improvement strategy that identifies a treatment gap, recruits expert trainers, and facilitates guided, iterative learning among a group of providers that are geographically or organizationally dispersed (Powell et al., 2015; Roosa, Scripa, Zastowny, & Ford, 2011; Wilson, Berwick, & Cleary, 2003). The LC model has been used to enhance the quality and delivery of services in both medical (e.g., Cavaleri et al., 2006) and mental health settings (e.g., Becker, Drake, & Bond, 2014; Beidas et al., 2012; Dorsey et al., 2013; Dorsey, Berliner, Lyon, Pullman, & Murray, 2014; Nadeem, Olin, Hill, Hoagwood, & Horwitz, 2013). The LC model is compelling for statewide implementation and dissemination efforts, as agencies across the state can be engaged simultaneously by means of inter-agency training cohorts and providers from additional agencies can be added. Essential components of the LC model include a *planning stage* in which an expert panel meets to develop the collaborative goals and framework, a leadership group is established, and agency teams are selected; an *action stage*, in which discreet learning activities that emphasize didactic and experiential learning with expert feedback are implemented; and an *outcome stage*, in which teams sustain and spread the intervention as the leadership group evaluates and makes improvements.

The LC model has shown promise for feasible and effective implementation in a transdiagnostic cognitive behavioral approach to adult psychopathology (Peterson et al., 2015; Peterson et al., 2016). Similarly, a 12-year LC across 16 jurisdictions in the U.S. and three European countries on evidence-based supported employment for individuals with serious mental illness demonstrated positive outcomes at the client-, trainee- and systems-level (Becker et al., 2014). While these results are promising, it is not yet clear what the essential components of an LC are and under what circumstances LCs are effective in provider- and systems-level adoption (Powell et al., 2015). Moreover, the LC model has yet to be applied to CBTp, and it is therefore not known whether such a model can facilitate the implementation and dissemination of a formulation-driven psychotherapeutic intervention for psychosis. In an effort to facilitate statewide CBTp implementation, the authors initiated a CBTp Learning Collaborative, which included two 12-month cycles (Phase 1 and Phase 2). The authors describe the process of developing the CBTp LC, the composition of the LC, and selected implementation outcomes.

Method

We were primarily interested in evaluating the extent to which the LC model could facilitate: (a) *adoption* (alternatively referred to as *uptake*; Proctor et al., 2011) of CBTp across a number of agencies simultaneously; (b) *penetration*, defined as the number of clients with psychosis exposed to CBTp across agencies (Proctor et al., 2011); (c) providers' perceived *skill development* over the course of their participation in the LC; and (d) *treatment fidelity*, or the degree to which an intervention was implemented as intended by the treatment developers (Rabin, Browson, Haire-Joshu, Kretuer, & Weaver, 2008). Each of these constructs is operationalized below. In addition, we present qualitative and quantitative data related to provider-identified barriers to implementation.

Planning Stage

Recruitment consisted of a presentation to the board of the local chapter of the National Council for Behavioral

Health, and follow-up recruitment flyers distributed to community mental health agencies (CMHAs) across the state. The state mental health authority also distributed recruitment flyers to their regional service areas. Attempts were made to engage CMHAs across the state that serve a large proportion of adults with schizophrenia spectrum disorders, solicit prospective trainees who provide psychosocial interventions to adult CMHA clients with schizophrenia spectrum disorder (as opposed to clinicians who do not work predominantly with clients with a psychotic diagnosis), and engage clinical supervisors in each responding agency. Managers and executive administrators were asked to volunteer to participate in the LC as well. Planning calls were held with the 12 agencies that showed initial interest in the project to establish goals, implementation strategies, and to emphasize the importance of involvement of staff across the organizational hierarchy. Once agency teams were established, the action stage began with an initial in-person workshop.

Action Stage

Subsequent to planning calls, two agency administrators maintained participation with the CBTp LC. The final expert panel for both phases of the CBTp LC consisted of the implementation project lead and affiliated implementation staff ($n = 4$), expert trainers ($n = 2$), and some representation from agency leadership ($n = 2$). During Phase 1 CBTp LC, training was delivered by co-authors (CC and JG) in two separate, in-person workshops that lasted 2 days each hosted on opposite sides of the state to reduce geographic barriers to participation. The in-person workshops consisted of didactic presentation of the CBT conceptualization of psychosis, phases of treatment, and brief review of the evidence base; trainer role-play demonstrations of case formulation and other CBTp techniques; applied learning through case studies; and clinician participation in paired role-plays. The workshops were followed by 6 months of biweekly phone consultation for a total of 12 one-hour consultation calls delivered among four training cohorts of approximately 10 clinicians each. Cohorts were grouped by agency and region to foster intraregional collaboration. Each cohort included at least one agency clinical supervisor. Consultation calls were facilitated by the trainers. Agency clinical supervisors in each cohort were encouraged to participate actively on the consultation calls by presenting their work with CBTp clients more frequently and modeling effective learning practices for the clinicians in their cohort. Calls consisted of a case presentation and discussion, case updates, case-based consultation questions, discussion of recent fidelity reviews, and as-needed clarification of concepts and techniques. In addition to general consultation calls, agency-based clinical supervisors were expected to attend at least four of six monthly 1-hour supervisor calls for more intensive case-based consultation, guided practice using the CBTp fidelity tool, and consultation on CBTp intra-agency supervision. Finally, certificates of completion for Phase 1 were contingent on attending 9 of the 12 consultation calls, delivering CBTp to at least one client, and receiving fidelity feedback on at least one CBTp session (agency supervisors only).

Toward the completion of the action stage of the first CBTp LC phase, participants requested additional training and consultation due to concerns that they were not yet proficient in the intervention. In some cases, participants had not yet picked up CBTp training cases or had experienced no-shows and early terminations. The expert panel agreed that providers needed more time, consultation, and individualized feedback. All Phase 1 LC participants were offered the opportunity to participate in Phase 2. The second 12-month LC focused on furthering the skills and knowledge of Phase 1 providers who elected to continue. The in-person, 2-day booster workshop initiated Phase 2 and focused on advancing previously learned skills through didactics, role-play, and roundtable discussion. Following the workshop, providers were grouped into three training cohorts based on geographic location and agency affiliation. All cohorts included direct service providers and were comprised of roughly seven clinicians and at least one clinical supervisor. The trainers again facilitated 12 biweekly, 1-hour consultation calls and six monthly supervisor calls for each cohort, following an identical consultation call structure as Phase 1. Based on participant feedback regarding the usefulness of fidelity reviews during Phase 1, the CBTp expert panel decided that all clinical supervisors would receive a minimum of three fidelity reviews each and clinicians would receive one fidelity review each during Phase 2. All other training and consultation strategies remained the same in Phase 2 as Phase 1. Expectations for all participants to receive a certificate of completion for the Phase 2 CBTp LC included attending 9 of the 12 biweekly consultation calls, delivering CBTp to at least one client, presenting at least one clinical CBTp case to the cohort during the consultation period, and receiving a minimum of one fidelity review. Supervisors were expected to attend at least four of the six supervisor consultation calls and receive at least three fidelity reviews.

Outcome Stage

Following the completion of the Phase 2 consultation calls, providers were advised to continue administering CBTp, consulting with internal staff to establish an individualized plan for their CBTp caseload. Consultation sessions with the national experts were replaced by

internal consultation facilitated by the clinical supervisors who had attended the supervisor consultation calls. Consultants and members of the expert panel were accessible to trained providers on an as-needed basis. The outcome stage for each LC was 6 months.

All evaluation activities received an exempt determination from the state Institutional Review Board.

Participant Measures

Providers participating in the Phase 1 CBTp LC were asked to complete three evaluations: preworkshop, immediately postworkshop, and 6-months postworkshop. In Phase 2, providers were asked to complete five evaluations: preworkshop, immediately postworkshop, 3-months postworkshop, 6-months postworkshop, and 12-months postworkshop. The 3-months postworkshop evaluation was used solely for the purposes of process improvement and therefore these data will not be presented in this paper. Aggregate data provided by providers from each agency were presented to agency administrators in an effort to address any identified implementation barriers. The 12-months post-workshop evaluation was added to Phase 2 to assess provider perceptions of CBTp skills after the action stage ended. Evaluations assessed the following:

Provider Demographic Characteristics

Provider demographics were reported on the preworkshop evaluation and included age, sex, highest education degree, number of years at agency, and number of years practicing psychotherapy. Information on provider race/ethnicity was not collected during either phase of the CBTp LCs.

Provider Perceptions of Implementation

The postworkshop and 6- and 12-month follow-up evaluations queried providers about perceived barriers to delivering CBTp at their agencies. In the interest of brevity, five questions were selected from the Implementation Leadership Scale (ILS; Aarons, Ehrhart, & Farahnak, 2014) staff version. Each item loaded onto one of the four scale domains: proactive ("My agency has developed a plan to facilitate implementation of evidence-based practice"), knowledgeable ("My agency is knowledgeable about evidence-based practice"), supportive ("My agency recognizes and appreciates employee efforts toward successful implementation of evidence-based practice"), and perseverant ("My agency carries on through the ups and downs of implementing evidence-based practice" and "My agency carries on through the ups and downs of implementing CBTp"). All items were rated on a 5-point Likert scale ranging from "Not at all" to "Very Great Extent." Questions were added to the evaluations in an effort to provide insight into the factors relevant to the intervention and implementation context and included both open-ended questions (e.g., "Please tell us which specific elements of CBTp were most difficult to apply" and "What did not work particularly well with delivering CBTp to your clients experiencing psychotic symptoms?") and Likert-scale items (e.g., "My caseload will be a barrier to my ability to provide a full dose of CBTp to my clients with psychotic symptoms" and "How challenging was applying the CBTp model?"), rated on a 7-point scale ranging from "Strongly Disagree" to "Strongly Agree."

Provider-Perceived Skill Development

Provider evaluations also assessed for self-perceived development of skills related to administering CBTp. Twenty questions rated on a 5-point Likert scale were modeled after a previously published skill self-evaluation for a CBT intervention (Dorsey et al., 2014; Table 3).

Adoption of CBTp

Adoption was measured at the provider- and agency-level by assessing the proportion of providers and agencies who continued to offer CBTp at the 12-month postworkshop follow-up time point relative to the original training group.

Penetration of CBTp

Penetration was operationalized in two ways: (a) as indicated by the number of clients being treated at the 12-month postworkshop follow-up time point, and (b) by the number of providers delivering services 1 year following the training.

Provider Fidelity

CBTp treatment fidelity was assessed using the Revised Cognitive Therapy for Psychosis Adherence Scale (R-CTPAS; Rollinson et al., 2008), adapted by the 5th and 6th authors (CC and JG) in order to enhance categorical structure of the measure and elements specific to the different phases of CBTp. The R-CTPAS categorizes skills in various ways, some of which pertain to all phases of treatment and some of which are phase-specific. Sessions reviewed received a final score of 1 (*Poor*), 2 (*Fair*), 3 (*Good*), 4 (*Very Good*), or 5 (*Excellent*). In addition to item- and total-scores, clinicians also received qualitative feedback on the session reviewed. A minimum total score of 3.0 out of 5 was taken as an indicator of acceptable fidelity to the treatment model for that particular rated session (Dreyfus, 1989; Granholm, Loh, Link, & Jeste, 2010; Sensky et al., 2000; Turkington, Kingdon, & Turner, 2002).

Plan of Analysis

Data were analyzed using SPSS version 19. Descriptive statistics for all study variables were examined; no outliers were identified and there was no evidence of heteroscedasticity. Analyses focused on provider demographics and participation in the learning collaboratives,

penetration of CBTp at the client- and provider-level, provider-perceived skill development, provider fidelity review scores, and provider-perceived implementation barriers. We conducted chi-square and analysis of variance (ANOVA) analyses to assess individual difference between Phase 1 and Phase 2 providers. The authors then conducted a chi-square to assess for differences between provider characteristics between Phase 1 and Phase 2, including provider role (clinician or supervisor), sex/gender, and highest degree. T-tests assessed whether there were significant differences in provider age, years at agency, years providing psychotherapy, and years supervising (supervisors only) between the two LC phases.

For providers who completed all training and consultation requirements, paired samples *t*-tests were conducted to assess change in perceived CBTp skill acquisition between the periodic skill evaluations, including perceived skills immediately following the workshop and at 6-months postworkshop. We conducted a repeated measures ANOVA to assess for change in perceived skill in CBTp over the entire learning period for those who completed all training and consultation requirements. To assess for differences in treatment fidelity, we compared the highest fidelity score between the clinicians and the supervisors by conducting a one-way ANOVA. A Pearson's r correlation was conducted to assess the relationship between providers' fidelity scores and years providing psychotherapy. A Pearson's r correlation was also conducted to assess the relationship between providers' self-assessment of CBTp skills and their highest and mean fidelity scores. Alpha was set at $p < .05$ for all analyses. Effect sizes are reported as correlations, Cohen's d, or using Hedges' g metric to account for sample size bias and sampling error.

Using consensus coding, the authors conducted an exploratory qualitative content analysis of providers' perceptions of barriers to delivering or implementing CBTp as well as their recommendations for enhancing future CBTp implementation efforts. Codes were derived using conventional content analysis.

Results

Participating Agencies

The 12 participating agencies represented seven counties across 4 of the 10 regional service areas in both rural and urban areas within the state. All participating agencies' primary source of funding is Medicaid via either a bundled or fee-for-service rate with their regional service area health plan. All agencies serve a significant proportion of adults with schizophrenia spectrum disorders and other serious mental illness. Standard care among all agencies was medication, case management, and vocational and peer counseling.

Provider Demographic Characteristics and LC Participation

Demographic data are presented for Phase 1 (Table 1) and Phase 2 (Table 2) LC participants. No significant differences emerged on any variables between supervisors and clinicians for either Phase 1 or Phase 2. All participating providers primarily worked with adult clients with schizophrenia spectrum disorder. They were not asked to report the types of interventions used prior to the CBTp LC. Anecdotally, most were providing nonformulation CBT skills, supportive therapy, and/or case management.

Participant attrition is reported for both LCs in Figures 1 and 2. Just over half (57.14%) of those who attended the in-person workshop for Phase 1 earned a certificate of completion at the conclusion of Phase 1. Of the 32 providers who received a certificate of completion following the first consultation period, 21 providers elected to continue on to the Phase 2 LC (65.63% retention rate) and 76.19% of participants who elected to continue on to the second phase of the LC earned a certificate of completion.

Provider characteristics in the Phase 2 LC were not significantly different from those in the Phase 1 LC; however, providers who elected to continue on to Phase 2 were disproportionately from the agency that was most active on the LC expert panel, $\chi^2(11) = 33.96$, $p < .01$. This agency was also the largest CMHA involved in Phase 1 and had the largest number of participating providers.

Table 1
Phase 1 CBTp Learning Collaborative Provider Characteristics

	Attended Training		Received Completion Certificate	
Characteristic	***N***	***%***	***N***	***%***
Total	56	100	32	57.1
Supervisor	18	32.1	10	31.3
Clinician	38	67.9	22	68.8
Agencies	12	-	-	-
Female	38	67.9	19	59.4
Highest degree	-	-	-	-
4-year college	3	5.4	0	0
MSW	23	41.0	14	43.8
Other masters	27	48.2	17	53.1
Doctoral degree	3	5.4	1	3.1
	Mean	**SD**	**Mean**	**SD**
Age	45.3	13.0	45.8	12.5
Years at agency	7.5	8.3	8.3	9.4
Years providing psychotherapy	10.6	9.5	11.1	10.6
Supervisor	14.9	7.4	14.4	7.8
Clinician	8.5	9.8	9.2	11.7
Years supervising (supervisors only)	7.1	5.9	7.7	7.2

Table 2
Phase 2 CBTp Learning Collaborative Provider Characteristics

Characteristic	Attended Training		Received Completion Certificate	
	N	%	*N*	%
Total	21	100	16	76.2
Supervisor	4	19.0	4	25.0
Clinician	17	81.0	12	75.0
Agencies	5		-	-
Female	13	61.9	10	62.5
Highest degree	-	-	-	-
4-year college	0	0.0	0	0.0
MSW	12	57.1	11	68.8
Other masters	9	42.9	5	31.2
Doctoral degree	0	0.0	0	0.0
	Mean	**SD**	**Mean**	**SD**
Age	46.1	12.0	43.9	12.0
Years at agency	10.0	11.0	8.4	10.8
Years providing psychotherapy	11.2	10.8	9.3	10.3
Supervisor	17.0	10.9	17.0	10.9
Clinician	9.8	10.7	6.7	9.1
Years supervising (supervisors only)	10.3	8.7	6.5	3.9

Adoption of CBTp

Providers from 5 of the original 12 agencies elected to continue on to the Phase 2 LC (41.67% agency continuation rate). Twelve months following the Phase 2 workshop, 3 of the 12 agencies reported that they continue to provide CBTp to clients (25% agency continuation rate). Across these three agencies, 16 providers, including three supervisors, continued to provide CBTp 1 year after consultation termination (28.57% provider continuation rate). Five providers (8.93%) no longer worked at the agency in which they were trained in CBTp and could not be contacted for follow-up data.

Penetration of CBTp

Participants reported that they had treated between one and six CBTp clients over the course of the LC (M = 3.06, SD = 1.65, mode = 2). Of the 16 providers still delivering services at the agencies in which they were trained, 12 providers (75%) were actively treating at least one client with CBTp 12-months postworkshop; only one was treating more than 2 CBTp clients. Across all 16 providers who completed the 12-month postworkshop evaluation, 49 clients had received a full treatment course, per participant self-report.

Provider-Perceived Skill Development

Self-perceived skill development data are depicted in Figure 3. Clinicians indicated significant perceived increase in skill acquisition immediately following the

Table 3
Participant Self-Perceived Skills Questions[1]

1. Engaging clients in active treatment (e.g., enhancing motivation, working with clients to problem-solve barriers to engagement).
2. Effectively orienting clients to how the CBT model applies to the treatment of psychotic symptoms and associated problems.
3. Administering standardized measures/checklists (e.g., BAVQ, P-scale, BDI-II) to assess clients' psychotic symptoms.
4. Using assessment information to guide treatment targets.
5. Collaboratively setting personally meaningful goals with clients.
6. Following up regularly on progress toward stated goals.
7. Working collaboratively with clients in articulating and developing a "problem list" of concerns that cause distress and interfere with life goals.
8. Interpreting scores on standardized symptom measures/checklists, giving feedback to clients, and collaboratively discussing results.
9. Collaboratively developing a shared "case conceptualization" model with clients used to guide treatment.
10. Teaching clients "cognitive restructuring," or how to reduce distress by challenging and potentially modifying untrue/unhelpful thoughts.
11. Providing psychoeducation and "normalization" around hallucinations, delusions, negative symptoms and other areas of concern expressed by clients.
12. Helping clients directly engage in cognitive restructuring/to target distressing emotions, beliefs, behavior, and symptoms related to psychosis.
13. Engaging clients in behavioral activation (e.g., scheduling activities to increase their exposure to pleasurable and/or meaningful activities) in order to impact negative symptoms/depression and/or reduce preoccupation with psychotic symptoms.
14. Engaging clients in behavioral coping strategies (e.g., reducing safety behaviors, behavioral experiments, dealing with voices in public) in order to impact and/or reduce preoccupation with psychotic symptoms.
15. Identifying clients' specific intervention needs for hallucinations, delusions, paranoia, negative symptoms, and/or conceptual disorganization.
16. Assigning homework to practice skills learned in treatment, including collaboratively identifying appropriate assignments and addressing potential barriers to completion.
17. Following up on and modifying homework as needed, including troubleshooting non-completed homework.
18. Facilitating clients' "ownership" and independent practice of skills, including those learned in therapy and preexisting skills and strengths.
19. Engaging members of the treatment team and/or family in details of the client's treatment via invitation to key sessions and/or other methods of collaboration.
20. Connecting past relapses to help create a personal model of relapse prevention; and modifying the relapse model as needed.

[1] Adapted from Dorsey, Berliner, Lyon, Pullman, & Murray (2014). All questions are rated on a 1 (minimal) to 5 (advanced) Likert scale.

Table 4
Provider-Perceived CBTp Skill Assessment (Phase 2 LC)

	N	Likert Scale	Pre-Workshop		Post-Workshop		6-Months Post-Workshop		12-Months Post-Workshop		Paired Samples t-test	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	*t*(df)	***p(2-tailed)***
Pre-Workshop vs. Post-Workshop	16	1–5	3.16	0.49	3.73	0.42	-	-	-	-	-5.74(15)	< .001
Post-Workshop vs. 6-Months Post-Workshop	14	1–5	-	-	3.79	0.40	3.54	0.55	-	-	2.49(13)	= .03
Post-Workshop vs. 12-Months Post-Workshop	14	1–5	-	-	3.75	0.44	-	-	3.53	0.55	1.73(13)	= .11

Phase 1 workshop (*paired t*[15] = -5.74; $p < .001$; $d = -1.43$) and at 6-months postworkshop (*paired t*[13] = 2.47; $p = .03$; $d = 0.66$), after which perceived skill level was constant. The supervisor group was not large enough to analyze statistically meaningful changes in scores across time.

Overall, self-assessed skillfulness increased as training progressed over time (Wilks' Lambda = .344, $F[3, 6] = 5.095$, $p = .029$, $\eta^2 = .656$). Self-perceived skills were highest immediately following the Phase 2 workshop. There was a commensurate reduction in CBTp skills from immediately postworkshop to 6-months postworkshop during each of the training cycles. Table 4 provides the means and paired comparisons of the skills data at each time point. Self-perceived skills increased immediately after the Phase 2 workshop, followed by a small but significant drop in self-perceived CBTp skills during the Phase 2 consultation period, after which self-perceived skills remained stable (Figure 3).

Provider Fidelity

Clinician and Supervisor Fidelity Reviews

The overall mean total fidelity score for all providers was 3.21 ($SD = 0.53$). Clinicians' ($n = 13$) overall fidelity scores ranged between 2.00 and 4.00 ($M = 3.15$, $SD = 0.58$). Supervisors' ($n = 4$) fidelity review scores ranged between 2.00 to 4.00 ($M = 3.38$, $SD = 0.34$; $F(15) = 1.391$, $p = .257$, $g = 0.388$), with supervisor's fidelity scores trending up with additional fidelity reviews (see Figure 4). Consistent

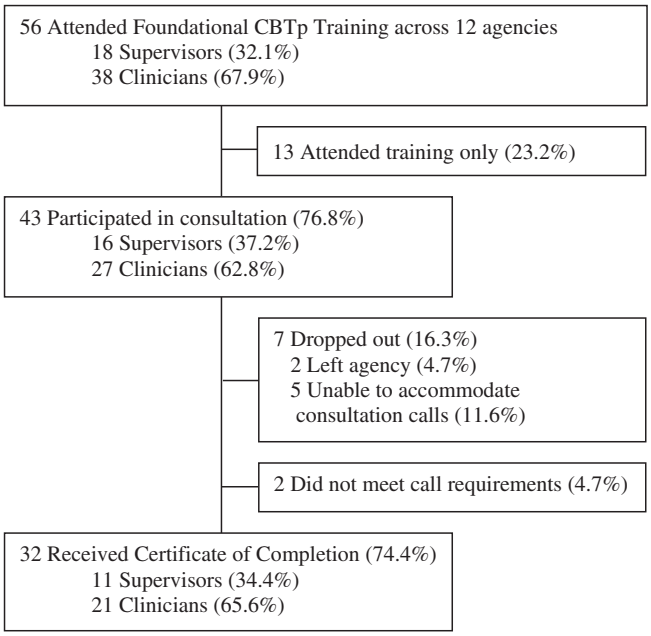

Figure 1. Phase 1 CBTp Learning Collaborative Training Participants

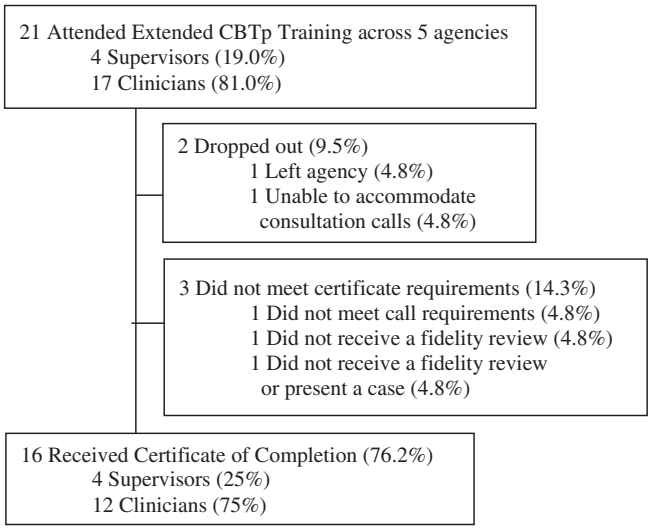

Figure 2. Phase 2 CBTp Learning Collaborative Training Participants

with this trend to achieve higher scores with subsequent fidelity reviews, supervisors' highest fidelity scores were superior to clinicians' highest fidelity scores, $F(15) = 7.236$, $p = .017$, $g = 1.625$. There was no correlation between fidelity score and number of years providing psychotherapy ($r = .07$, $p = .79$).

Provider Perceived Skill Ratings and Fidelity

Because fidelity reviews can be time-consuming, costly, and rare in the context of community mental health, we conducted a post-hoc correlation analysis of providers' self-assessment of their CBTp skillfulness and fidelity ratings provided by the expert consultants to ascertain the potential for relying on self-assessment as a proxy for treatment adherence. We did not detect a statistically meaningful correlation between providers' self-assessment at 6-months postworkshop and providers' highest fidelity score ($r = .39$, $p = .14$), nor between their 6-months postworkshop self-assessment and the mean fidelity score ($r = .34$, $p = .20$).

Provider-Perceived Implementation Barriers

There was 100% agreement between raters on coded responses to perceived implementation barriers. Responses embodied four themes: (a) technological barriers related to the consultation, (b) barriers related to the

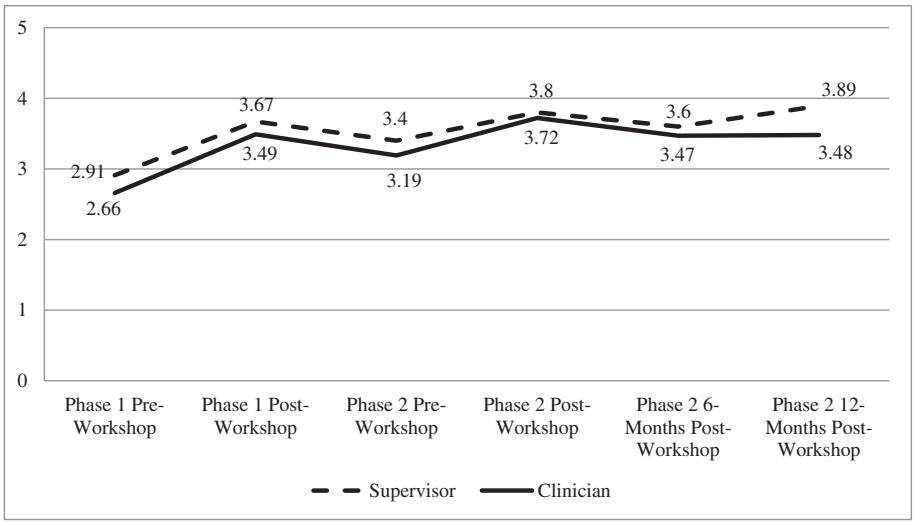

Figure 3. Provider Self-Perceived Skill Development

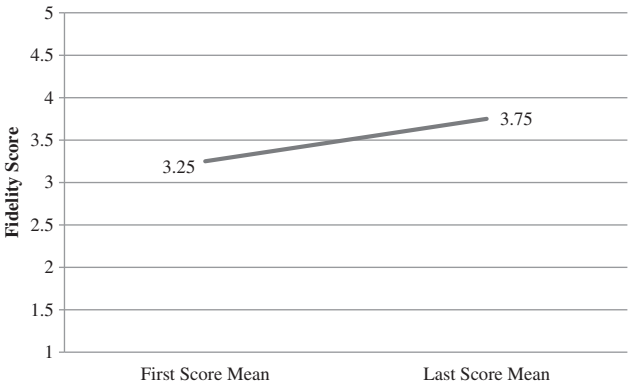

Figure 4. Supervisor Fidelity Review Scores (1-5)

intervention, (c) barriers related to the client population, and (d) barriers related to agency awareness and support of CBTp implementation. These themes are expounded upon below.

Qualitative Theme 1: Technological Barriers Associated With Consultation

Primary technological barriers included mutual participant-consultant access to a HIPAA-compliant file sharing platform, audio recording and uploading session recordings, and using measurement-based care to track outcomes over the course of CBTp. With regard to the latter challenge, none of the agencies that participated in the CBTp LC integrated measures of psychosis into their existing Electronic Health Record. This may have been due, at least in part, to the inability of the implementation team to work individually with participating agencies to tailor technical assistance and quality assurance and improvement recommendations when working concurrently with multiple behavioral health agencies during a brief implementation window.

Remote, phone-based consultation provided challenges to both engagement and development or refinement of skills. Many providers (41.67%) critiqued phone-delivered consultation and reported that videoconference-delivered consultation would have enhanced and facilitated both engagement and learning during the consultation period.

Qualitative Theme 2: Barriers Related to the Intervention

As previously described, most providers (94.7%) had a master's degree or doctoral degree in mental health with a mean of 10.61 years providing psychotherapy. Prior to the start of the Phase 1 LC in-person training, providers estimated their CBTp skill level in the low to moderate range ($M = 2.74$, $SD = 0.59$), despite no previous exposure to formal CBTp didactics or practical experience. Phase 2 LC trainees identified specific elements of CBTp as challenging to apply. The most commonly identified techniques were cognitive restructuring (45.45%), case formulation (27.27%), and how to sequence the intervention (18.18%).

Qualitative Theme 3: Barriers Related to the Client Population

In regards to barriers endorsed that were related to the client population, providers reported the perception that client engagement (63.63%) and comprehension of the concepts (27.27%) were hampered by active psychosis. Although reported with some frequency anecdotally during the course of the LC, only one respondent (9.09%) formally reported client recruitment as a challenge on the 6-month postworkshop evaluation. Finally, two respondents noted challenges associated with obtaining clients' consent to audio record sessions.

Qualitative Theme 4: Barriers Related to Agency Awareness and Support

Forty-two percent of respondents noted that time constraints imposed by high caseloads hindered their ability to engage to the extent they would have liked during the consultation period. They also cited time constraints in clinical and administrative duties as barriers to picking up additional CBTp clients. Many providers suggested that working with agency administrators to temporarily reduce clinical and administrative responsibilities during their participation in the LC would be helpful in the uptake of CBTp at their agencies. One in four respondents endorsed a perceived lack of agency support and/or awareness of what was required while learning CBTp and endorsed skepticism that their agency had participated in active planning for CBTp implementation and sustainability.

Discussion

We evaluated the impact of a CBTp LC among 12 mental health agencies on several implementation outcomes, including the adoption, penetration, self-perceived skill development, and fidelity. Approximately half (57.14%) of Phase 1 and one-quarter (24.81%) of Phase 2 trainees did not complete LC required activities; this attrition rate is within the range previously reported for EBPI implementation efforts (Beidas et al., 2012; Beidas & Kendall, 2010; Dorsey et al., 2014). Despite initial support and enthusiasm among participants for bringing CBTp to their respective agencies, only 25% of the participating agencies had CBTp-trained providers administering CBTp 1 year following the completion of the Phase 2 LC, indicating relatively low rates of adoption of the intervention at the agency level.

Penetration rates 1 year after the second phase of CBTp training and consultation did not increase following the conclusion of the LC action stage. Of the 12 participants who continued administering the treatment after the LC ended, CBTp caseloads remained between one and two clients. Providers may be treating 2–4 patients per year at

this rate, raising the issues of both poor remediation of the inaccessibility of CBTp in CMHAs and cost effectiveness of CBTp LCs (Dopp, Hanson, Saunders, Dismuke, & Moreland, 2017). We cannot be certain about the extent to which the barriers to implementation identified above affected the rate of administering CBTp to new clients during the follow-up period, nor do we know whether penetration changed subsequent to the observation period. In addition, the penetration rate could not be calculated for our participants, as number of eligible CBTp clients was not known.

Overall, trainees perceived that the in-person workshop enhanced their CBTp skills, reported a small but significant drop in self-perceived CBTp skills during the initial consultation period, and reported a modest improvement in self-perceived CBTp skill development during the second consultation period that was sustained at the 12-month post-workshop follow-up. This pattern speaks to the challenges experienced once participants attempt to apply acquired knowledge from a workshop to actual clients. Alternatively, the drop in self-perceived skill may speak to an overestimation of proficiency in CBTp, influenced at least in part by the fact that may of the providers were teaching their clients CBT skills but were not delivering the full manualized treatment. Objective indices of skill competence over time are a more meaningful indicator of knowledge and skill acquisition, although self-perceptions may be helpful in orienting trainers and supervisors to a provider's level of confidence.

Despite treating few clients with CBTp during the learning period, on average, participants received an acceptable fidelity score on the sessions that were evaluated, operationalized as a total score of a 3.0 out of 5 or higher on the basis of previous research (Granholm et al., 2010; Sensky et al., 2000; Turkington et al., 2002) and common practice (Hardy, n.d.). No relationship between fidelity scores and the number of years providing psychotherapy was observed, suggesting that clinicians who have fewer years of experience as psychotherapists may be as capable of learning to administer adherent CBTp as those who have more years of experience. Trainees who received multiple fidelity reviews demonstrated higher mean fidelity scores, suggesting that, as one would expect, receiving more fidelity reviews enhanced adherence to the treatment model. Finally, in line with previous research, which suggests that therapists' self-assessment of treatment adherence are often inaccurate (e.g., Brosan, Reynolds, & Moore, 2008; Carroll, Nich, & Rounsaville, 1998; Hogue, Dauber, Lichvar, Bobek, & Henderson, 2015), there was no correlation between providers' self-assessment and either their highest or mean fidelity score.

Previous research suggests that the barriers to implementation of psychotherapeutic interventions for schizophrenia spectrum disorders exist at the level of individual providers, service recipients, and the organizations attempting to systematically integrate EBPIs (e.g., Berry & Haddock, 2008; Rowlands, 2004). Participating providers in the Phase 2 LC identified aspects of each of these barriers to CBTp implementation, and spontaneously provided additional scrutiny to the role of technology in facilitating (or, more appropriately, hindering) consultation. Also in line with previous research (Waltman, Hall, McFarr, Beck, & Creed, 2017), providers in the Phase 2 LC reported difficulties with cognitive restructuring, case formulation, and delivering other components of the intervention.

Limitations

This was a state-funded initiative aimed at a relatively rapid statewide rollout of CBTp. As such, it provides insight into a real-world implementation of CBTp into the routine practice of publicly funded mental health agencies, which is valuable due to the paucity of published accounts of CBTp implementation (for an exception, see Dark, Whiteford, Ashkanasy, Harvey, Crompton, & Newman, 2015). Nevertheless, the primary limitation associated with the current evaluation is that it did not occur in the context of a rigorous implementation or hybrid implementation-effectiveness trial, thereby limiting our understanding of and ability to assess potentially relevant implementation variables, the time we had to engage prospective stakeholders of a CBTp LC, and the support and attention provided to participating agencies. Budget limitations prohibited more frequent assessment of CBTp fidelity. Similarly, because the funding required annual renewal, it was impossible to ascertain in advance whether LC activities could be sustained beyond the fiscal year. Several statewide changes to managed mental healthcare may have affected aspects of the implementation. Anecdotally, several administrators at participating agencies reported that they were preoccupied by a transformation in the way that the state managed mental health block grant and state mental health contracts during the time that the LC took place. Finally, the CBTp LC would have benefitted from more engagement across participating agencies to support practitioners, to support the agencies in systems-level changes needed to adopt and sustain CBTp (e.g., creating new referral pathways, progress note templates in the medical records, data collection for quality assurance and improvement), and ensure clear plan-do-study-act cycles to identify successful strategies and remediate obstacles.

Recommendations

As both agencies and the systems in which they operate strive to comply with national treatment guidelines by

implementing and disseminating CBTp or other evidence-based psychotherapies for psychosis, the following recommendations may provide helpful guidance.

Recommendation 1: Enhance Individual Agency Consultation and Support

Stakeholders and participants identified several challenges associated with applying the LC model to statewide implementation of CBTp. While there was a great deal of attention focused on training and providing support to the clinicians and supervisors during the implementation period, cross-regional, inter-agency implementation of CBTp may require more time, collaborative planning, and site-specific adaptations to ensure that agencies incorporate CBTp into their menu of clinical services. For example, a better understanding of the clinical model, discipline-specific roles, work flow, and reimbursement models may facilitate long-term sustainability (Creed, Stirman, Evans, & Beck, 2014). Working with one agency at a time during the action stage can also facilitate mentorship of EBPI champions who will work with agency leadership to advocate for changes needed to sustain the EBPI over time (Biggs & Brough, 2015). Although more time- and resource-intensive, such in-depth pre-implementation engagement and, potentially, agency-specific adaptation is emerging as best practice in EBPI implementation (Stirman et al., 2010). It is not yet clear whether the LC model provides sufficient support to those agencies attempting to newly adopt CBTp when the standard of care excludes EBPIs for individuals with psychotic disorders.

Recommendation 2: Strategic Use of Technology to Enhance Implementation and Build Internal Agency Infrastructure

Although not an explicit focus of the evaluation of the LC model on CBTp implementation, technology emerged as a theme when trainees were asked to provide feedback on barriers. Anecdotally, the perception of technology as posing multiple barriers to implementation was noted by the implementation team as well. Given that technology can be used to enhance the accessibility and ease-of-use of educational material, treatment documents, standardized measures, and assessment score entry and analysis, technical modifications are needed to minimize technological challenges. Agencies should have local technical support and means for hosting audio files as well as a CBTp resource repository on an internal secure server so that documents and audio files are available after the implementation team completes the formal consultation period. Such efforts contribute to building the internal infrastructure to support CBTp practice and supervision at each agency. Electronic Health Records should be flexible so as to accommodate the addition of relevant progress monitoring tools EBPIs require. In the absence of such capabilities, adherence to measurement-based care will suffer (Fortney et al., 2017).

Recommendation 3: Explore Methods of Reducing Trainee Attrition

The dropout rate among the current sample suggests that alterations to the recruitment and selection procedure may be warranted. Future research should address how implementation strategies affect trainee retention and attrition. For instance, a more competitive process of selecting clinicians based on a Request for Applications may enhance the perceived value of participation to completion (Creed et al., 2014). Similarly, a phase-based approach to implementation in which a large number of providers are initially trained followed by more intensive consultation to a subsample of high-performing providers may prove a good value and promote long-term sustainability.

Recommendation 4: Fidelity Reviews

Although fidelity reviews are costly and time consuming (Schoenwald, 2011), data from the current study underscore that increasing the number of fidelity reviews for a CBTp trainee may facilitate skill uptake and execution. Creative solutions to fidelity assessment in community behavioral health settings should be explored further. For instance, behavioral rehearsal is a well-known and effective training method (Beidas & Kendall, 2010) that has recently been adopted as a proxy or analogue fidelity method (Beidas, Cross, & Dorsey, 2014; Dorsey et al., 2017). Because behavioral rehearsal can be conducted remotely via phone or videoconference, it may be a viable and flexible low-cost proxy to fidelity review of audio recorded sessions. Alternatively, individualized feedback may be provided during live playback of recorded therapy sessions during a group consultation session (e.g., Creed, Stirman, Evans, & Beck, 2014; Stirman et al., 2017). Future research is needed to compare alternative methods of fidelity assessment with traditional expert fidelity reviews for CBTp.

Conclusion

The vast majority of extant literature on the topic of LC models for health-related intervention implementation fails to address the outcomes addressed in the current paper—namely, adoption, penetration, fidelity, and sustained practice after the active implementation period. Overall, the use of the LC model to scale CBTp for statewide implementation, train providers to adherent practice, and enhance the delivery of CBTp in public sector outpatient settings demonstrated promising results with regard to fidelity and limited evidence of adoption and penetration during or after the active implementation period. While the ability of LCs to engage in the implementation process with a greater number of

agencies spread across a large region is appealing in the face of the paucity of providers trained to administer CBTp and increasing pressure for statewide implementation of evidence-based programs (Fixsen, Blase, Metz, & Van Dyke, 2013), the focus on breadth may sacrifice depth that is more critical to the implementation and sustainment of CBTp. Systematic evaluation of implementation models and strategies to support the uptake and sustainment of CBTp in community mental health settings is sorely needed to address the persistent shortage of mental health providers delivering CBTp.

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