



Statewide dissemination of an evidence-based practice using Breakthrough Series Collaboratives



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ABSTRACT

The emerging field of implementation science has begun to inform the increasing efforts to disseminate evidence-based practices. The Breakthrough Series Collaborative (BSC) model was used to disseminate trauma-focused cognitive behavioral therapy (TF-CBT) across Connecticut over three years. Participants were 179 outpatient clinical staff across 16 community-based agencies that implemented TF-CBT. A total of 588 children and families received TF-CBT. Children completing treatment showed significant reductions in PTSD and depression symptoms. Quantitative and qualitative data about the BSC model are presented. The BSC is a promising approach for dissemination of evidence-based practices, and recommendations for additional research on BSCs and sustainment of evidence-based practices are made.

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1. Introduction

There has been much progress in the development and dissemination of best practices in children's mental health over the past 15 years. Evidence-based practices (EBPs) – those demonstrated by research to be effective in treating targeted health problems – have been developed to treat a variety of health and mental health conditions in children and adults. There are now more than 210 distinct EBPs for children and adolescents listed on the Substance Abuse and Mental Health Services Administration's (SAMHSA) National Registry of Evidence-Based Programs and Practices. As the number of EBPs increases, policy makers, researchers, and others have been faced with the challenge of how to broadly disseminate these models to community-based settings. Despite the development of so many child behavioral health EBPs and increasing attention to dissemination (Gaudiano & Miller, 2013; Gotham, 2006; McHugh & Barlow, 2010), EBPs are still not routinely used in community settings. Thus, there has been limited impact on public health (Kazak et al., 2010).

1.1. The challenges of bringing science to practice

EBPs have been criticized for not being sufficiently “transportable” to real world settings, and the availability of EBPs in communities continues to lag behind treatment development and research (Chorpita & Regan, 2009). When community-based providers have attempted to implement EBPs, efforts have often been challenged by organizational, policy, and staffing barriers (Foa, Gillihan, & Bryant, 2013; Ganju, 2003). These efforts have historically included traditional didactic training methods with little or no follow-up, which have been minimally effective at creating sustainable changes in practice (Beidas & Kendall, 2010; Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; Herschell, Kolko, Baumann, & Davis, 2010; Jensen-Doss, Cusack, & de Arellano, 2008; Lyon, Stirman, Kerns, & Bruns, 2011).

Implementation of an EBP with fidelity is a complex process. In Damschroder et al. (2009) widely-used Consolidated Framework for Implementation Research (CFIR), five implementation domains are described: intervention characteristics (the EBP to be implemented), outer setting (factors external to the agency), inner setting (characteristics and culture of the agency implementing the program), characteristics of individuals (those implementing the program), and process (strategies used in implementation). Barriers to implementation in community-based settings exist in each of these domains, across

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multiple levels. For example, clinicians may have difficulty modifying their approach to therapy because of limited time, lack of ongoing support or supervision, or perceptions that the new intervention is not compatible with their treatment philosophy or clientele (Ruzek & Rosen, 2009). Agencies may lack resources or leadership support to implement a new program, and high staff turnover common to community based agencies (CBAs) may impede sustainability (Woltmann et al., 2008) (an inner setting characteristic). Agency, state, or federal policies and incompatibility with reimbursement mechanisms may also be barriers to implementation (an outer setting characteristic). Addressing these issues requires complex implementation strategies that are not part of traditional training models, including the participation of clinical supervisors and agency leaders who can support implementation.

Ironically, there are currently no evidence-based *implementation* models to disseminate EBPs. However, there is a rapidly growing body of research on implementation science, conceptual frameworks, and promising implementation models (Aarons, Hurlburt, & Horwitz, 2011; McHugh & Barlow, 2010; Tabak, Khoong, Chambers, & Brownson, 2012). Promising models for implementing behavioral health treatments in community settings include The Interactive Systems Framework (Wandersman et al., 2008), the ARC (Availability, Responsiveness, and Continuity) model (Glisson & Schoenwald, 2005), Community Development Teams (Bruns & Hoagwood, 2008) and others (e.g. Chamberlain, Roberts, Jones, Marsenich, Sosna & Price, 2012). There are also highly structured, and tightly controlled dissemination models monitored by a central organization associated with the treatment developers, such as Multisystemic Therapy (MST; Edwards, Schoenwald, Henggeler & Strother, 2001).

1.2. Breakthrough Series Collaboratives

The Breakthrough Series Collaborative (BSCs) is another model currently being used and tested for disseminating EBPs. Confronted with the challenge of bringing health care research to practice, the Institute for Healthcare Improvement (IHI) developed the BSC to implement practice improvements in medical settings (Kilo, 1998). The BSC involves an intensive 6–15 month process that differs from traditional training and is consistent with Fixsen et al.'s (2005) stages of implementation and review of structured implementation strategies. The BSC includes staff with diverse roles in a team-based learning approach (including leadership), consists of multiple in-person trainings and site-specific consultation, emphasizes the use of data, feedback, and quality improvement, and focuses on organizational change and sustainability, as well as clinical skills. These components are consistent with emerging constructs described in the implementation science literature that are necessary for successful implementation (Nadeem, Gleacher, & Beidas, 2013; Novins, Green, Legha, & Aarons, 2013; Wandersman et al., 2008), and are consistent with the five domains of the CFIR model (Damschroder et al., 2009). Promising results have been found for the BSC model in healthcare (Young, Glade, Stoddard, & Norlin, 2006), education (Wiecha, Nelson, Roth, Glashagel, & Vaughan, 2010), child welfare (Miller & Ward, 2008) and mental health (Cohen, Adams, Dougherty, Clark, & Taylor, 2007).

The National Child Traumatic Stress Network's (NCTSN) National Center at Duke University and the University of California, Los Angeles (UCLA) pioneered adaptation of the BSC model to disseminate EBPs for treating child traumatic stress through what was called "learning collaboratives" (Ebert, Amaya-Jackson, Markiewicz, Kisiel, & Fairbank, 2012; Markiewicz, Ebert, Ling, Amaya-Jackson, & Kisiel, 2006). The NCTSN is funded by SAMSHA, part of the U.S. Department of Health and Human Services, and is comprised of a network of more than 150 sites across the country. The NCTSN adopted the BSC as a primary mechanism for disseminating EBPs across NCTSN sites nationally, and has coordinated over 40 regional or national BSCs. However, little research exists about the use of BSCs to disseminate (Nadeem, Olin, Hill, Hoagwood, & Horwitz, 2014). An evaluation of the NCTSN's first TF-

CBT BSC showed that the model was used to successfully disseminate TF-CBT with fidelity to 11 NCTSN sites across the country, and was perceived as an effective implementation model by participants (Ebert et al., 2012). However, the authors noted that outcomes from children receiving TF-CBT were not available to determine effectiveness and recommended further research about whether the BSC model could be used with typical community-based agencies, which may not have the same resources as NCTSN-funded sites.

Connecticut was among the first states to use the BSC model to disseminate a child behavioral health EBP across a statewide system of care beginning in 2007. This initiative was the first step of an ongoing broader strategy to disseminate and sustain TF-CBT across the state. The current study, which describes the first phase of this dissemination from 2007–2010, was designed to extend the limited research on BSCs by providing process and outcome data about whether and how BSCs can be used within a statewide system of care to disseminate an EBP to community based agencies. The study was designed to answer the following questions: (1) whether the BSC is a feasible model to disseminate an EBP to typical community-based agencies, (2) whether staff had positive perceptions of the BSC approach and improvements in attitudes about EBPs, (3) whether staff reported increased utilization of TF-CBT, and (4) whether disseminating TF-CBT through a BSC resulted in positive outcomes for children.

2. Method

2.1. Implementation plan

2.1.1. Background

The Connecticut Department of Children and Families (DCF) is an integrated state agency with five mandates: child welfare, behavioral health, prevention, juvenile justice, and substance abuse. In 2006, DCF administrators sought to disseminate an EBP for children suffering from traumatic stress reactions because of increased awareness of the needs of traumatized children in the child welfare system (Greeson et al., 2011) and the long-term costs associated with child trauma exposure (Alonso et al., 2011; Felitti et al., 1998; Walker et al., 2003). This initiative also grew out of previous successful statewide implementations of in-home EBPs and recognition that virtually no outpatient EBPs were widely available in the state.

2.1.2. Treatment selection

A number of EBPs for children suffering from traumatic stress exist (Gillies, Taylor, Gray, O'Brien, & D'Abrew, 2012). TF-CBT, one of the most widely studied models, includes psychoeducation and teaching practical skills for children to manage thoughts and feelings associated with traumatic stress reactions, the development and processing of a "trauma narrative" and sharing of the narrative with a caregiver in a safe therapeutic setting, and skills to enhance future safety and development (Cohen, Mannarino, & Deblinger, 2006). TF-CBT is supported by more than 18 studies, including 15 randomized clinical trials, which demonstrate improvements in children's PTSD, depression, and anxiety symptoms, and improvements in parental distress and parenting skills (for a review, see Cary & McMillen, 2012). The NCTSN has also successfully used the BSC model to disseminate TF-CBT across the country since 2005 (Ebert et al., 2012). Subsequently, there have been a number of statewide efforts to disseminate TF-CBT through a variety of approaches (Cohen & Mannarino, 2008; Sigel, Benton, Lynch, & Kramer, 2013), including North Dakota (Wonderlich et al., 2011), Arkansas (Sigel, Kramer, et al. 2013), and New York (Hoagwood et al., 2007). In 2007, DCF selected TF-CBT to disseminate in Connecticut based upon the available research, consultation with local experts in child trauma, and the success of the NCTSN's TF-CBT dissemination efforts.

2.1.3. Coordinating center

In consultation with the National Center for Child Traumatic Stress at Duke University, DCF staff designed a proposal outlining the structure of a statewide BSC and released a request for qualifications to identify a statewide Coordinating Center for the initiative. In early 2007, DCF selected the independent non-profit Child Health and Development Institute of Connecticut, whose Center for Effective Practice functioned as an intermediary organization (Franks, 2010) to collaborate with DCF, TF-CBT treatment developers and trainers, family members, and community providers to develop the BSC implementation plan.

2.1.4. Selection of agencies

Sixteen community-based provider agencies (from four to six agencies per year) with outpatient children's behavioral health clinics were selected to participate through a competitive state procurement process. Each agency selected assembled a TF-CBT team, akin to a local "implementation team," of 7–12 staff including clinicians, clinical supervisors, and senior leaders (agency administrators). Agencies selected staff to participate based upon their capacity, interest in TF-CBT, and other responsibilities. Each team also included a family partner from the community to provide input on implementation from the consumer perspective. Agencies designated one clinician or supervisor on the team as the TF-CBT site coordinator. Each team completed the BSC change packet, an organizational readiness self-assessment, and participated in a site visit from the Coordinating Center prior to implementation.

2.1.5. Funding

The initiative was funded by DCF through the use of federal mental health block grant funds at an annual cost of \$244,000 per year (in 2007 dollars) for three years from 2007–2010. Funds were used to establish and support the Coordinating Center staff and all training, quality assurance, and evaluation activities. DCF also provided a small stipend (\$30,600) to each community-based agency implementing TF-CBT to offset lost productivity and to pay for a part-time TF-CBT site coordinator. The goal was to develop sustainable TF-CBT programs in each agency where direct services would be reimbursed as outpatient care through private insurance or Medicaid.

2.1.6. Faculty and planning team

The Coordinating Center assembled a BSC faculty comprised of staff from the Coordinating Center, the DCF program officer, a TF-CBT train-the-trainer, an expert in child trauma assessment, and a family representative. The faculty mirrored Fixsen et al.'s (2005) concept of a statewide "implementation team," an essential element of the structural changes required during the installation phase of program implementation. This team planned all trainings, consultation, and quality improvement activities required to implement TF-CBT using the BSC methodology.

2.1.7. Learning sessions

Staff participated in seven days of in-person training ("Learning Sessions") spread throughout the year. Learning Sessions relied on active-learning techniques including role plays, small group discussions, interactive games, and other participatory strategies consistent with adult learning principles (Lyon et al., 2011). Staff learned in a variety of formats; for example, meeting together as an agency team, across agencies by staff role (e.g., all supervisors met together), or in small groups with diverse roles. Participants also led presentations and developed activities to share their innovations and successes with staff from other agencies in the spirit of a common BSC motto: "Share relentlessly and steal shamelessly." Approximately two-thirds of training time focused on enhancing clinical skills required to assess child traumatic stress and to implement TF-CBT, and one third focused on implementation, data, organizational change, and quality improvement techniques.

2.1.8. Training tracks

Distinct training "tracks," including separate break-out activities, were developed for clinicians, supervisors, senior leaders, and family partners. Training and consultation were provided for staff in each track at learning sessions and through monthly track-specific consultation calls. For example, the supervisor track focused on how to supervise staff new to an EBP and to monitor treatment fidelity of supervisees. Senior leaders discussed organizational challenges to implementing an EBP, including organizational culture, staff turnover, reimbursement issues, using agency implementation data, and sustainability; a focus on organizational culture improves sustainability and child outcomes (Novins et al., 2013). These tracks are consistent with the National Implementation Research Network's (NIRN) framework, which describes necessary competency, organizational, and leadership implementation drivers (National Implementation Research Network, 2015).

2.1.9. Model for Improvement

Staff were trained to utilize the Model for Improvement methodology (Langley et al., 2009) to make practice improvements to support implementation. The Model for Improvement involves identifying a specific barrier or problem, defining simple and creative approaches to making improvements, and using data to evaluate which improvements are effective through Plan–Do–Study–Act (PDSA) cycles. These PDSAs or "small tests of change" are typically conducted simultaneously, in rapid succession, and by multiple team members. For example, an agency that is struggling with identifying appropriate clients to receive TF-CBT may conduct several PDSAs that try out a variety of creative approaches, but each on a small scale (e.g., starting with one client) to help increase identification of appropriate clients. Those approaches that data show are effective are then modified if necessary and re-tested with additional clients or clinicians. Strategies continue to be refined, and effective techniques are rapidly spread throughout the team, agency, and the entire collaborative.

2.1.10. Action periods

During action periods, the time between learning sessions, each local TF-CBT team met weekly to discuss implementation of TF-CBT, received weekly telephone technical consultation from the Coordinating Center, had access to a collaborative intranet site, and participated in cross-site consultation calls by track. These approaches provided multiple opportunities for additional support, consultation, and coaching from faculty and other participants throughout implementation.

2.2. Participants

2.2.1. Staff trained

A total of 77 clinicians, 33 supervisors, and 23 senior leaders from the 16 agencies selected to participate, as described previously, began the BSC. Each agency began with an average of 8.4 staff (range 5–10). Staff were mostly female (86%) and predominantly Caucasian (76%), with the remainder Latino (16%), African-American (6%), or other/mixed ethnic background (2%).

2.2.2. Children receiving TF-CBT

A total of 734 children began TF-CBT across the 16 agencies. These children presented for treatment to the agency for a range of concerns and were identified by the agency as appropriate for TF-CBT during screening. Out of these children, 146 declined to have their data shared for research purposes or consent was otherwise unable to be obtained. Analyses that follow are thus based on the remaining sample of 588 children. The majority of children (60.9%) were female. The racial/ethnic makeup of the sample was diverse (40.3% White/Caucasian; 27.9% Latino/Hispanic; 14.1% Black/African-American; 10.7% Bi-racial/Mixed; 7.0% Other/Unspecified). Children were an average of 11.2 years old ($SD = 3.6$; Range 3–21). Most children (63.9%) lived with at least one biological parent. Of the children for whom socioeconomic status

indicators were available, combined annual family income was ≤\$20,000 for 45.1% and the vast majority of parents (74.9% of mothers; 83.2% of fathers) had a High School Degree/GED or lower level of education.

2.3. Measures

2.3.1. Child measures

Data were collected through web-based systems developed to provide quality assurance and program evaluation. Child-report versions of each measure were completed with children aged seven and older, and caregiver-report versions were completed with the primary caregiver of each child age five and older. Assessment measures were administered as face-to-face interviews by clinicians.

2.3.1.1. Trauma History Screen (THS). The THS is a measure of trauma history and the subjective level of distress related to each of 19 different forms of trauma exposure (e.g. physical abuse, domestic violence, sexual assault) that was developed for this initiative and administered prior to treatment. It was adapted from the Traumatic Events Screening Inventory (Ippen et al., 2002) and the Trauma History Questionnaire (Berkowitz, Stover, & Marans, 2011). In this study, the number of different traumatic events reported, out of the 19 types, was used.

2.3.1.2. UCLA PTSD Reaction Index for DSM-IV (PTSD-RI). (Decker & Pynoos, 2004). The PTSD-RI is intended to screen for exposure to trauma and posttraumatic stress disorder symptoms in children, and has excellent reliability and validity (Steinberg et al., 2013). In this sample, Cronbach's alpha was good to excellent for the child ($\alpha = .89$) and caregiver ($\alpha = .90$) reports. Only the 22-item symptom scales were used in this study. Responses are on a 5-point Likert scale, with higher numbers indicating more PTSD symptoms. The PTSD-RI provides an overall PTSD severity score, and separate scales for re-experiencing, arousal, and avoidance. The PTSD-RI was administered at baseline, every 3 months, and at discharge.

2.3.1.3. Short Mood and Feelings Questionnaire (SMFQ). The SMFQ is an 11-item measure of children's depression symptoms with good reliability (Angold et al., 1995). In this sample, Cronbach's alpha was good to excellent for the child ($\alpha = .88$) and caregiver ($\alpha = .89$) reports. Responses are on a 3-point Likert scale where higher numbers indicate more depression symptoms. The SMFQ was administered at baseline, every 3 months, and at discharge.

2.3.1.4. Caregiver Satisfaction Questionnaire (CSQ). The CSQ is a 12-item measure of treatment satisfaction with TF-CBT developed for this initiative. In this study, data from the following items were used: "I am happy with my child's progress in treatment," "Overall, I am satisfied with my child's treatment," and "I would recommend this treatment to a friend who had a child in the same situation." Responses are scored on a 5-point Likert scale ranging from "very much false" (1) to "very much true" (5). The CSQ was administered every 3 months and at discharge.

2.3.2. Clinician measures

2.3.2.1. Evidence-Based Practice Attitude Scale (EBPAS). The EBPAS is a 15-item measure of clinicians' attitudes about EBPs (Aarons, 2004). It is scored on a 5-point Likert scale, with higher numbers indicating more favorable attitudes (one subscale is reverse scored). The EBPAS was completed by clinicians and supervisors before and after the BSC.

2.3.2.2. Implementation metrics. Clinicians entered monthly web-based implementation data ("metrics") about their use of TF-CBT. These data included information about each TF-CBT case, number of sessions provided, and case disposition. Therapists entered session data on every child served each month until the case was closed.

2.3.2.3. Fidelity. Clinician-reported fidelity data were collected monthly for each child served through the web-based data system. Clinicians completed a brief form of the TF-CBT fidelity checklist (Deblinger, Cohen, Murray, Epstein, & Mannarino, 2007), and noted which required TF-CBT clinical components they used (psychoeducation, relaxation, parenting skills, affective expression, cognitive coping, trauma narrative, conjoint parent-child sessions, and enhancing safety). A total fidelity score was computed by taking the percentage of required treatment components used as reported by clinicians over the entire duration of treatment (conjoint and parenting sessions were not required for children who did not have a caregiver involved in treatment, and in vivo exposure was not required for any children as it is an optional clinical component of TF-CBT).

2.3.2.4. Staff BSC evaluation survey. Participating staff completed a post-BSC evaluation developed for this study that asked about their experience participating in the BSC and the perceived value of different components of the BSC.

2.4. Focus groups

Separate focus groups were held for clinicians, supervisors, and senior leaders at the end of the BSC. These groups were facilitated by psychologists and psychology post-doctoral students who were not involved in the dissemination. Focus groups were recorded, transcribed, and reviewed for common themes. Additional qualitative data were collected through notes from consultation calls with site coordinators, senior leader meetings, and written learning session evaluations.

3. Results

The results are organized into two sections: evaluation of the BSC methodology and TF-CBT implementation outcomes.

3.1. Evaluation of the BSC methodology

3.1.1. Provider evaluations

As shown in Table 1, staff reported that the most valuable components of the BSC were having a designated TF-CBT site coordinator, clinical training in the TF-CBT model, and weekly TF-CBT implementation team meetings at their agency. Identifying a designated site coordinator, or "dissemination field agent" (Kreuter, Casey, & Bernhardt, 2012) has been reported to be an important implementation component (Karlin & Cross, 2014). Staff reported that the Model for Improvement and TF-CBT consultation calls were perceived as the least helpful components. The only significant differences across roles were that senior leaders rated consultation calls, use of metrics, and the intranet site as more helpful than did clinicians and supervisors.

3.1.2. Qualitative feedback and observations

Qualitative feedback about the BSC was overwhelmingly positive. Staff at all levels generally reported that participating in the BSC enhanced their ability to implement and sustain TF-CBT. Many staff contrasted this approach with one-time trainings in TF-CBT or other EBPs that they had previously attended (which had rarely resulted in their ability to successfully implement the model). For example, one clinician commented, "It was helpful to spread the training out over a year—so we could implement and continue to learn at the same time." Common themes identified as being especially helpful were having multiple learning sessions, regular TF-CBT team meetings, frequent opportunities for consultation and support, use of standardized measures and metric data, emphasis on the team-based implementation approach, and opportunities to learn from staff at other agencies. Senior leaders noted many secondary gains, including anecdotally reporting reduced treatment length and no-show appointments among families receiving TF-CBT compared to usual care. They also reported that their

Table 1
Provider evaluations about the Breakthrough Series Collaborative (N = 83).

	Clinicians N = 57	Supervisors N = 14	Sr. leaders N = 12	F
How useful or important were the following aspects of the BSC for your agency's implementation of TF-CBT?				
Having a designated TF-CBT coordinator on your team	4.2	4.1	4.8	3.0
Training in TF-CBT clinical skills at learning sessions	4.2	4.1	4.6	1.7
Weekly TF-CBT team meetings at your agency	4.2	4.2	4.4	0.4
Training and use of standardized assessment measures	3.8	3.6	4.4	2.3
Having a designated TF-CBT intranet site	3.1	2.9	4.1	4.1*
Getting monthly implementation metric reports for your agency	3.0	2.7	4.6	11.1***
Training in the Model for Improvement	2.5	2.6	3.3	2.5
Consultation calls	2.0	2.1	3.0	5.2**

Rating scale: 1 = not at all; 2 = little; 3 = somewhat; 4 = very; 5 = extremely.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

agencies were better prepared to implement other EBPs, and that there were improvements in staff morale among those participating in the BSC because of greater self-efficacy about their treatment of children suffering from traumatic stress.

The most common concern about the BSC was the increased time and unreimbursed costs required of agencies to participate. A related concern was that children appropriate for TF-CBT represented a small minority of an outpatient clinician's caseload. Staff were concerned about the time to learn and implement an EBP that was applicable to few of the children on their caseload, as well as how they would potentially manage learning and implementing a number of EBPs for each of the many clinical problems they treated (e.g. see [Chorpita & Daleiden, 2009](#); [McHugh & Barlow, 2010](#)). Staff did, however, report that they would use many of the TF-CBT clinical skills with other clients who were not receiving TF-CBT. Additionally clinicians expressed dissatisfaction with consultation calls because there were too many people on call or because call topics were not always relevant to their own cases. Some staff also reported little benefit from training on use of data and the Model for Improvement, and preferred to receive additional clinical training instead. However, qualitative feedback suggested that most staff believed the additional time and cost associated with the BSC were worth the benefits of participating. The most prominent concern among senior leaders at the end of the BSC was how their agency would be able to sustain the model given high levels of staff turnover and the lost productivity and unreimbursed costs for providing an EBP, including data collection, training, and coordination.

3.2. TF-CBT implementation outcomes

3.2.1. Staff trained

As shown in [Table 2](#), 84.3% of the 133 staff who began the BSCs completed the training year (the remainder left their agency or program area). Clinicians reported seeing an average of 5.4 TF-CBT cases during the training year (range 0–21), and clinical supervisors reported an average of 2.9 cases (range 0–9). Six senior leaders saw at least one TF-CBT case. Of note, 6 (7.7%) clinicians and 3 (9.1%) supervisors did not report any TF-CBT cases during the year. Observations of agencies that struggled with implementation, as indicated by serving fewer children with TF-CBT, suggested that they had limited initial buy-in from agency administrators, lacked internal TF-CBT “champions,” and/or had higher

than average levels of staff turnover (a particular challenge when they lost their most experienced or enthusiastic TF-CBT staff during implementation).

An additional 46 staff joined the TF-CBT teams and BSC training after the first learning session, primarily to replace staff lost to turnover and to expand an agency's capacity. These additional staff reported seeing an additional 56 TF-CBT cases (average 1.3 each, range 0–11), but 29 (63%) of them did not report a single TF-CBT case. An average of 36.8 (range 10–85) children received TF-CBT per agency during the entire year. At the end of the training year, all 16 agencies had sustained their TF-CBT programs, were providing TF-CBT to new clients, and continued to report monthly TF-CBT metric and child assessment data.

3.2.2. Attitudes about evidence-based practice

Of the 113 staff who completed the implementation year, 74 completed the EBPAS at pre- and post-implementation (65% response rate). A 2 (time) \times 53 (staff role) repeated measures ANOVA was computed, which showed a significant effect of time, $F(1,71) = 5.54$, $p = .02$, but not of staff role, $F(2,71) = .56$, or time \times staff role, $F(2,71) = .74$. Thus, staff attitudes about EBPs improved modestly from pre- to post-implementation, and there were no differences in attitudes (or changes to attitudes) by staff role. [Table 3](#) shows the pre- and post-implementation scores on the EBPAS by staff role.

3.2.3. Child trauma exposure

Complete trauma history data from the THS was available for 521 children. The events children were most likely to be exposed to were: knowing someone who died (experienced by 78.7% of children), seeing or hearing people fighting or threatening to hurt one another (76.6%), prolonged separation from a caregiver (66.2%), seeing a family member arrested or in jail (58.2%), and being physically hurt or threatened (57.6%). The average number of distinct types of traumatic events experienced was 7.6 ($SD = 3.3$) of the 19 different types of events on the THS.

3.2.4. Child outcomes

For the entire sample of children served, treatment lasted an average of 18.1 sessions ($SD = 15.4$; Median = 15.0; Range 0–116). The average duration of treatment was 7.2 months ($SD = 6.0$; Median = 6.0; Range 0–48). A total of 231 children (39.3%) were identified as having

Table 2
Staff trained in TF-CBT during the Breakthrough Series Collaboratives.

	Started training year	Completed training year	% staff turnover during training year	New staff added during training year
Clinicians	77	65	15.6%	42
Supervisors	33	29	12.1%	2
Senior leaders	23	18	22.3%	2
Total	133	112	15.8%	46

Table 3
Therapist attitudes about evidence-based practice pre- and post-implementation.

	Pre-implementation		Post-implementation	
	Mean	SD	Mean	SD
Clinicians (N = 45)	2.90	.51	3.11	.41
Supervisors (N = 18)	3.02	.43	3.10	.37
Senior leaders (N = 11)	3.08	.50	3.21	.43

Scores on the Evidence-Based Practices Attitude Scale (EBPAS) range from 0 to 4, with higher scores indicating more favorable attitudes.

completed the entire treatment model successfully, 190 dropped out of treatment or had their case closed prematurely (32.3%), 43 children (7.3%) moved or sought treatment elsewhere, 26 children (4.4%) were referred to a higher level of care, and 52 (8.8%) had an unknown disposition. Most children who dropped out or otherwise did not complete treatment successfully did not have any follow-up data, so outcomes are presented only for treatment completers.

Of the 231 children who completed treatment, both pre- and post-treatment assessments were available for 188 children (if a post-assessment was not completed, the last follow-up assessment was carried forward as a post-assessment). As shown in Table 4, significant reductions in child PTSD symptoms were reported by child, $t(187) = 11.1$, $p < .001$ (40.3% reduction) and caregiver, $t(180) = 7.3$, $p < .001$ (28.4% reduction). Significant reductions in child depression symptoms were reported by child, $t(134) = 6.9$, $p < .001$ (47.1% reduction) and caregiver, $t(148) = 6.7$, $p < .001$ (39.3% reduction). Treatment was completed in an average of 27.3 sessions ($SD = 15.9$) over an average of 9.6 months ($SD = 5.8$).

3.2.5. Satisfaction with treatment

A total of 227 children had CSQ data available. The final assessment point with valid CSQ data was used in analyses. Overall, the intervention was positively regarded by caretakers. The mean rating of happiness with the child's progress in treatment was 4.43 ($SD = 0.78$; 88.9% rating as "somewhat" or "very much" true). The mean rating for overall satisfaction with the treatment was 4.78 ($SD = 0.52$; 96.0% rating as "somewhat" or "very much" true). Most individuals also indicated they would recommend the treatment to a friend who had a child in a similar situation ($M = 4.85$, $SD = 0.41$; 98.2% rating as "somewhat" or "very much" true).

3.2.6. Fidelity

Fidelity data were available for 528 children (89.8% of the sample), but were only analyzed for the 231 children for whom treatment was deemed complete. Total fidelity scores for completed cases was quite high ($M = 0.936$, $SD = 0.119$). Specific treatment components and reported completion rates were as follows: Trauma Narrative (98.3%), Affective Expression (97.4%), Relaxation Skills (96.5%), Cognitive Coping (96.5%), Psychoeducation (94.8%), Parenting Skills Training (91.7% of cases with caregiver involvement), Conjoint Parent-Child Trauma Narrative Sessions (89.5% of cases with caregiver involvement), and Enhancing Safety (84.8%). The optional In Vivo Exposure component was used in 53.7% of cases.

Table 4
Outcomes of children completing TF-CBT.

	N	Pre-treatment Mean (SD)	Post-treatment Mean (SD)	t
UCLA PTSD-RI child report	188	30.36 (14.75)	18.12 (12.12)	11.12***
SMFQ child report	135	8.43 (6.15)	4.46 (4.63)	6.91***
UCLA PTSD-RI parent report	181	29.28 (14.60)	20.97 (13.51)	7.33***
SMFQ parent report	149	8.73 (5.85)	5.30 (5.33)	6.70***

UCLA PTSD-RI: UCLA Posttraumatic Stress Disorder Reaction Index for DSM-IV; SMFQ = Short Mood and Feelings Questionnaire.

*** $p < .001$.

3.2.7. Plans for Sustaining TF-CBT

Provider responses post-BSC about their plans to sustain TF-CBT with fidelity following implementation are shown in Table 5. Providers reported that they were most likely to continue providing TF-CBT with fidelity and to use standardized assessment measures. Staff reported being less likely to use the Model for Improvement and lower levels of confidence about receiving adequate TF-CBT supervision at their agency. There were no significant differences across staff roles.

4. Discussion

The BSC methodology was used to successfully disseminate TF-CBT to 16 community mental health agencies across Connecticut over three years during the first phase of an ongoing statewide dissemination. All 16 agencies successfully implemented TF-CBT as evidenced by providing the treatment to children, albeit with variation in capacity, and maintained TF-CBT programs at the end of the BSC. Clinicians reported a strong commitment to continuing to provide TF-CBT following the BSC. Children completing TF-CBT showed significant reductions in PTSD and depression symptoms. The positive child outcomes are promising considering that they are based upon the participating therapists' first TF-CBT cases as they were learning the model, and when considering the very high rates of trauma exposure among the population. These results are significant for outpatient community mental health care and are comparable to outcomes from TF-CBT clinical trials (Cohen, Deblinger, Mannarino, & Steer, 2004; Cohen, Mannarino, & Knudsen, 2005). Unfortunately, follow-up and discharge assessments were not completed on most of the children who did not complete treatment, so intent to treat analyses could not be completed. Overall, the results suggest that the BSC methodology can be used to broadly disseminate an EBP with good clinical outcomes, although adaptations to some components may be beneficial, and further understanding of how the BSC compares to other approaches and how it can be most efficiently utilized are needed.

Participant feedback about the BSC was positive. Many staff credited the BSC model with contributing significantly to their ability to implement TF-CBT. They also noted broader positive effects for their agency and staff, and demonstrated significant improvements in attitudes about EBPs. The successful implementation is significant in light of the multiple demands placed on agency staff, the additional time and costs required to participate in a BSC and to utilize an EBP, the diversity among agencies, staff, and their clientele, and staff turnover. Results indicated that the Model for Improvement and consultation calls were perceived as less valuable than other components of the BSC. For example, modifications to the Model for Improvement that are being tested in later phases of this dissemination include developing examples more relevant to front-line clinicians, creating simpler tools to track improvements, and enhancing training of senior leaders to support their staff in use of the Model for Improvement. Additional research on BSCs could identify more effective strategies and to what extent staff in various roles benefit from using the Model for Improvement during EBP implementation.

The primary concerns with consultation calls appeared related to the relatively high number of clinicians on the calls and challenges structuring calls to be relevant to a wide group of participants with diverse experience and caseloads. Developing more effective methods of providing expert consultation is especially important as research demonstrates the importance of consultation following training in EBPs (Nadeem, Gleacher, & Beidas, 2013). Specifically research is needed to identify the optimal and most cost-effective number of participants, format, and frequency/duration of consultation calls. For example, providing calls with fewer participants would likely improve each individual's participation and increase the amount of coaching received from a consultant; others are using one on one clinical consultation with success rather than a group format (Amaya-Jackson, Saunders, & Dunn, 2014). Other strategies being used in subsequent phases of Connecticut's

Table 5
Provider beliefs about sustaining TF-CBT after the Breakthrough Series Collaborative (N = 83).

	Clinicians N = 57	Supervisors N = 14	Sr. leaders N = 12	F
How likely do you think you are to do each of the following after the BSC?				
Remain on your agency's TF-CBT team	4.6	4.6	4.9	0.8
Practice TF-CBT with fidelity	4.4	4.4	4.3	0.1
Use standardized assessment measures with trauma cases	4.3	4.1	4.7	1.5
See new TF-CBT clients	4.4	4.0	4.3	0.7
Use TF-CBT skills with NON TF-CBT clients	4.2	4.0	4.4	0.7
Involve a caregiver in every session	3.9	4.1	3.6	0.9
Complete TF-CBT cases within 16–24 sessions	3.7	3.6	3.9	0.2
Receive adequate supervision in TF-CBT	3.5	3.5	3.5	0.1
Use the Model for Improvement	2.7	2.5	3.3	1.5

Rating scale: 1 = not at all; 2 = little; 3 = somewhat; 4 = very; 5 = extremely.

dissemination appear promising, including structuring consultation calls around specific case discussions, common fidelity challenges, treatment components, and using behavioral rehearsal.

This study had several significant limitations common to community-based research. For example, there was no comparison group, no outcome data on non-completers, and self-reported fidelity measures were used rather than having independent raters. Additionally, limited data on mediators and moderators of implementation were available, so analysis of individual agency differences was not possible. These data also only represent use of TF-CBT during the initial implementation year and are not an indication of whether or how the practice continued beyond the BSC, although data suggested that clinicians indicated that they were likely to continue providing TF-CBT. We recommend four general areas for future research efforts: the use of BSCs, implementation research, implementation costs, and sustaining EBPs.

First, additional research on BSCs for implementation of EBPs is needed (Nadeem et al., 2014), including with EBPs other than TF-CBT. Additionally, studies examining the “core components” or essential elements of the BSC are needed to inform the emerging field of implementation science (Proctor, Powell, & McMillen, 2013). The cost and “dosage” of implementation support will be important considerations for future research in order to develop more efficient and effective BSCs. One important question is whether the BSC model can be modified to reduce upfront costs without sacrificing effectiveness. Findings from this study suggest that research is needed to identify improved consultation call methods and use of quality improvement methodology to support implementation (and to what extent these BSC components are necessary for successful implementation). For example, traditional phone consultation consists of a wide range of strategies and content areas (Nadeem, Gleacher, Pimentel, et al., 2013), may have little effect on client outcomes, and has been shown to be less effective than live video consultation (Funderburk et al., 2014). The use of BSCs to promote cross-system collaboration in EBP implementation is another promising approach. For example, the use of Community-Based Learning Collaboratives to bring multiple “brokers” of children's services together with clinicians trained in EBPs may result in increased referrals and uptake (Saunders & Hanson, 2014). Many other states are using BSCs or learning collaboratives to disseminate TF-CBT (and other EBPs), and evaluations of these initiatives will further inform this work (Sigel, Benton, et al., 2013).

Beyond the BSC model, research is needed to compare different implementation approaches. Further, comparing the relative value of different implementation strategies or components (e.g. Model for Improvement, senior leader consultation) may allow more efficient implementation models, in the same way that efforts are being made to identify the core components and common elements of EBPs (Weisz et al., 2012). Continued research is also needed to understand how specific implementation strategies are most successful and efficient (e.g. the number of people trained at one time, live versus recorded training,

number of staff on consultation calls). Innovative research approaches are needed, as traditional methods such as randomized controlled studies are often difficult given the scale and costs of dissemination initiatives. Even defining “successful” implementation and sustainment of an EBP is challenging, and development of validated measures of implementation and sustainment is an important research agenda. For example, to what extent must the practice be utilized, by how many staff, for how many children, to what level of fidelity, with what outcomes, and for how long, in order to be considered “successful”?

Additionally, research is needed to understand the best ways of implementing the increasing number of often-overlapping EBPs for a range of clinical problems. Specifically, are EBPs like TF-CBT that target a small percentage of children seeking treatment best implemented broadly by training many generalist clinicians, or would having fewer specialized clinicians that provide primarily or exclusively TF-CBT be a better use of resources (Comer & Barlow, 2014)? Alternatively, additional research on a common elements or core components approach (Chorpita & Daleiden, 2009; Weisz et al., 2012) is needed to compare outcomes and cost-effectiveness.

The most significant barrier cited by senior leaders was the additional costs associated with EBP implementation born by providers. These costs included data reporting and interpretation, additional training and supervision time, time required to prepare for TF-CBT sessions, and scheduling modifications to facilitate TF-CBT that reduced overall reimbursement. Senior leaders reported that the high rate of staff turnover (17% during the implementation year) would make it difficult to get a steady stream of new staff adequately trained and to maintain internal expertise in the model. The data indicate that new staff saw far fewer cases than those that began the BSC. The full costs of implementation – including the time and resources required by the agency and participating staff – are rarely accounted for in EBP manuals or descriptions. Research is needed to better document these additional costs, as well as improved outcomes and potential future cost savings to guide funding and policy decisions. For example, there is recent evidence that despite higher initial implementation costs for TF-CBT, future treatment costs are reduced, yielding significant cost-savings over time (Greer, Grasso, Cohen, & Webb, 2013). However, while the up-front implementation costs are borne by non-profit community based agencies, the longer term costs savings are more likely to be realized by state agencies and insurance companies—thus, an argument could be made for investment by those entities in implementation and sustainment of EBPs. For example, the third author has been hired by a private insurance company to train its network of providers in TF-CBT. In addition to implementation costs, methods to support the marginal service delivery and other costs to sustain EBPs through higher reimbursement rates or other financial incentives must be developed and studied.

While staff expressed a strong desire to sustain TF-CBT, concerns were raised about how to maintain training and data reporting infrastructure after the BSC. Senior leaders requested ongoing training and

consultation opportunities for new and experienced staff, as well as continued external data reporting for agency quality assurance and clinical assessment scoring. They agreed that it would be cost prohibitive for individual agencies to bring in a national trainer, or to develop the infrastructure required for data reporting to maintain treatment quality and use of standardized measures when they received no additional reimbursement for delivering the EBP. The lack of a resident national TF-CBT trainer in Connecticut, or the ability to develop a cadre of local expert trainers, has also limited the state's capacity to provide ongoing training and consultation. Research is needed to examine the key elements of, and the best ways to provide, this ongoing support to sustain EBPs. For example, it is unknown how costs and sustainment outcomes compare when infrastructure for ongoing support is developed internally at each agency compared to centralized and standardized across many providers by an external entity. Data from the next steps in Connecticut's TF-CBT dissemination, including the degree to which TF-CBT was sustained and results from the development of a centralized statewide quality assurance center, to are currently being collected and will be reported in the future.

In summary, the BSC is a promising implementation model that was well-received by staff, resulted in successful implementation in Connecticut, and which appears to address many of the challenges to implementation and sustainment of EBPs. A BSC requires more resources than traditional training but may result in more effective implementation and potentially longer term cost savings and benefits. The BSC model equips agencies to implement a new practice, to efficiently use data for quality improvement, and to build internal capacity to sustain and support the practice. This emphasis on organizational change is not only critical to the sustainability of an EBP (Kimberly & Cook, 2008), but may build capacity for an agency to adopt other EBPs and to improve practice more broadly. As the need for structured and transportable EBP implementation models is becoming widely recognized, the BSC presents an effective model for bridging the gap between science and practice in real world settings. Future research that identifies the essential elements of BSCs and other implementation strategies, in comparison to costs and outcomes, are critical for furthering the field of implementation science and ultimately improving outcomes in community-based settings.

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