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Evaluation of an Implementation Model: A National Investigation of VA Residential Programs

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Abstract

This national investigation utilizes qualitative data to evaluate an implementation model regarding factors influencing provider use of two evidence-based treatments for posttraumatic stress disorder (PTSD). Semi-structured qualitative interviews with 198 mental health providers from 38 Department of Veterans Affairs' (VA) residential treatment programs were used to explore these issues regarding prolonged exposure (PE) and cognitive processing therapy (CPT) in VA residential PTSD programs. Several unique and some overlapping predictors emerged. Leadership was viewed as an influence on implementation for both CPT and PE, while a lack of dedicated time and resources was viewed as a deterrent for both. Compatibility of CPT with providers' existing practices and beliefs, the ability to observe noticeable patient improvement, a perceived relative advantage of CPT over alternative treatments, and the presence of a supportive peer

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network emerged as influential on CPT implementation. Leadership was associated with PE implementation. Implications for the design and improvement of training and implementation efforts are discussed.

Keywords

Implementation; Evidence-based practice; Posttraumatic stress disorders

Until recently, most research on implementation of evidence-based treatments (EBTs) in mental health was not systematic or theory-driven (Proctor et al. 2009) but rather involved case studies or highly controlled trials that did not include multiple programs or whole institutions (McHugh et al. 2009). Theories provide conceptual understandings of variables and provide a framework within which researchers can conduct their analysis.

One comprehensive theoretical model for understanding implementation of EBTs was initially developed by Rogers (1962, 2003) and elaborated on by others (Greenhalgh et al. 2004). This model construed implementation as a complex process influenced by five broad constructs: (a) perceived characteristics of innovation, (b) potential adopter characteristics, (c) communication and influence, (d) system antecedents and readiness (inner organizational context), and (e) outer (inter-organizational) context. The Rogers–Greenhalgh model is consistent with findings from three other systematic narrative reviews (Durlak and DuPre 2008; Fixsen et al. 2005; Stith et al. 2006) and provided the foundation for the Consolidated Framework for Implementation Research (Damschroder et al. 2009).

The relationship between perceived attributes of innovations (e.g., relative advantage, compatibility, observability) and implementation is well-established across interdisciplinary studies (Greenhalgh et al. 2004). Although perceived attributes are not sufficient to explain implementation of innovations, they explain a significant portion of its variance. Indeed, key perceived attributes account for a substantial portion of the variance in implementation of health care innovations (for review see Greenhalgh et al. 2004).

Other implementation constructs have received much less attention. According to Rogers (2003), implementation is associated with individual adopter characteristics such as a provider's openness to new ideas and ability to cope well with a high degree of uncertainty about an innovation. Indeed, Borntrager et al. (2009) found that providers' attitudes towards EBTs improved when they perceived higher levels of flexibility and control in their approach to delivering treatments. Further, there are also data to support that communication and influence variables (e.g., social connectedness and access to an expert opinion leader or local change agent Cook 2009a, b) impact the adoption of mental health treatments. Similarly, inner-organizational context, which includes both system antecedents and readiness for innovation (e.g., dedicated time and resources), seem to explain a modest but significant amount of variance (Greenhalgh et al. 2004). There are only a handful of primary studies of implementation of health care innovations that have examined the impact of factors beyond the organizational level (i.e., sociopolitical climate; inter-organizational norm-setting; environmental stability) and the results are equivocal (Greenhalgh et al. 2004).

Qualitative research addressing perceptions of front-line providers have complemented quantitative assessments of implementation in other healthcare fields, but only recently has this strategy been applied to implementation efforts in mental health (e.g., Proctor et al. 2007; Stirman et al. 2013). In particular, understanding providers' perspectives on the use of various EBTs creates a lens for which treatment developers and disseminators can understand and address factors that may hinder implementation and promote those that influence adoption. In addition, valuable knowledge may be obtained regarding the environments that providers perceive as effective for sustaining use of these EBTs in real world practice and those that inhibit use.

EBTs for Posttraumatic Stress Disorder (PTSD) in the Department of Veterans Affairs (VA)

PTSD is a debilitating disorder that affects over 20 million Americans at some point in their life (Kessler et al. 2005). Left untreated, PTSD can become a chronic condition contributing to substantial psychological, physical, social and occupational impairments (Kessler 2000). Most community providers do not use EBTs for PTSD with their traumatized patients (e.g., Gray et al. 2007).

In 2007, the VA instituted a nationwide training and consultation initiative in two EBTs for PTSD, prolonged exposure (PE; Foa et al. 2007) and cognitive processing therapy (CPT; Resick and Schnicke 1996) to all qualified mental health providers (Karlin et al. 2010). To date, over 1,300 VA and Department of Defense (DoD) clinicians have attended the 4-day PE workshop and 5,900 the 2-day CPT workshop (Department of Veterans Affairs 2013). In addition to the training and case consultation, this ongoing initiative is backed by a mandated VA policy that all veterans with PTSD have access to PE or CPT (VA/DoD Clinical Practice Guideline Working Group 2010), the development of a mentoring program to improve communication between regional and national clinic managers (Bernardy et al. 2011), and at least one staff member at each medical center is appointed to the role of evidence-based psychotherapy coordinator.

As the largest single healthcare provider in the U.S. and with unprecedented federal funding and top-down administrative support for the EBT initiative, the VA affords an ideal opportunity in which to study implementation. Although dissemination of new knowledge generated by randomized controlled trials takes an average of 17 years to be utilized in community practice (Institute of Medicine 2001), an accelerated transfer of PE and CPT knowledge seems to have occurred in certain settings in the VA (Karlin et al. 2010) while less in others (Shiner et al. 2013). For example, although PE and CPT adoption was by no means universal in VA residential PTSD treatment programs, many providers were trained in and using one or both to some extent (Cook et al. 2014).

Residential PTSD programs represent a small but significant part of VA PTSD care (Rosenheck et al. 1997). Most often these programs serve veterans who have more severe symptoms and chronic problems and limited community support than those who typically engage in outpatient services. Residential care provides a variety of services in addition to

formal mental health treatment including social, recreational, vocational and family counseling.

The aim of this study was to evaluate an implementation model in understanding the use of PE and CPT in a national sample of VA residential PTSD treatment programs (N = 38). The five constructs of the Rogers–Greenhalgh (2004) implementation model were used to guide data collection and analysis. Qualitative investigations of predictors of EBT adoption have typically focused on just one intervention (e.g., Aarons & Palinkas 2007; Curran et al. 2012) or have addressed only global perceptions of EBTs (Dimeo et al. 2012; Stewart et al. 2012). To our knowledge, this is the first investigation to qualitatively evaluate the Rogers–Greenhalgh model to implementation of EBTs for mental health.

In addition to noting the frequency of predictors across all 38 programs, we compared low and high adopters on these constructs to identify those most closely associated with implementation. This strategy may assist in understanding the constructs that matter most to those at the ends of the adoption continuum, and which identified in the dozens of implementation models, are the most important ones to intervene upon.

Method

Participants—From 2010 to early 2012, 243 treatment directors, providers, and staff from 38 VA residential PTSD treatment programs across the U.S. reporting patient outcome monitoring data to the VA's Northeast Program Evaluation Center (NEPEC) were approached to participate in an evaluation of the implementation of PE and CPT. Of these, 191 completed both a quantitative survey and qualitative interview, 13 completed the survey only, seven completed the interview only, and 32 did not participate. Of the 32 non-participants, four refused; 15 had retired, were on medical leave or left their position; and 13 did not respond to study communication.

Data for this analysis come from the 198 participants who completed the semi-structured qualitative interview. A majority were psychologists (n = 110, 55.6 %), social workers (n = 66, 33.3 %) or nurses (n = 11, 5.6 %), followed by psychiatrists (n = 5, 2.5 %) and other professionals (n = 6, 3.0 %). Most were female (63.6 %) and length of time working in the residential program ranged from 3 months to 30 years, with a mean of 5.84 years. Although study participation was not limited to those providers eligible to receive EBT trainings, almost all (93.9 %) met this criterion. Providers ineligible to receive the training were included if they were viewed as influential in EBT implementation. Of the 186 eligible providers, 150 (80.6 %) had received VA training in CPT and 115 (61.8 %) had VA training in PE. Some providers had participated in formal training prior to the VA training initiative.

Measures—Our investigative group undertook development of an assessment tool for the Rogers–Greenhalgh model because there was none available (Cook et al. 2012). Through a systematic literature review and iterative process aimed at developing consensus, we identified three types of data to operationalize different constructs: survey items, qualitative interview questions and administrative data. Survey item development and measurement of key constructs can be found elsewhere (Cook et al. 2012). Results reported here are derived from the qualitative interview only.

The semi-structured interview[1] included items assessing the five constructs of the Rogers–Greenhalgh model: (a) perceived characteristics of the innovations, specifically PE and CPT; (b) individual adopters' characteristics; (c) communication and influence (e.g., social networks, peer opinion leadership), (d) inner organizational context: system antecedents and readiness to adopt (e.g., dedicated time/resources, leadership); and (e) outer context (e.g., sociopolitical climate, incentives and mandates).

Numerous questions throughout the semi-structured interview asked about challenges, successes, strengths and weaknesses of the treatments, program and implementation efforts (e.g., What was your experience like bringing [the treatment] into your practice?). The majority of the interview questions were designed a priori to map onto specific Rogers–Greenhalgh concepts (e.g., How are you able to implement the treatment in regards to available time and resources?) but there were also more general questions for which response were subsequently mapped onto model concepts (e.g., How did the program make the decision to implement [the treatment] (or not)?).

Procedure—This study was exempted for review by the Yale Human Research Protection Program due to perceived low risk to human subjects and approved by the VA Connecticut Health Care System Institutional Review Board. Eligible providers were identified through program staffing lists and invited via email to take part in a confidential web-based survey and telephone-based interview. Providers who agreed to the interview were mailed an audio-visual consent form. Interview questions were open-ended and follow-up probative questions were asked to elucidate further detail. Interviews took place via telephone and averaged 40 minutes in length.

To facilitate analysis, we developed a codebook with 32 sub-constructs across the five main constructs (e.g., perceived innovation characteristics: relative advantage, compatibility, etc.) in accordance with the Rogers–Greenhalgh model[2]. Explicit definitions for each sub-construct (see Table 1) had been previously determined (Cook et al. 2012) and were used to aid in coding. Two master-level raters (SD, VS) independently reviewed and coded each interview to identify comments that confirmed provider perceptions of factors influencing PE and CPT implementation. Quotations were assigned codes according to a priori themes (i.e., our operationalization of the Rogers–Greenhalgh model sub-constructs). Each interview was coded by the two raters four times, once for PE predictors, once for CPT predictors and once each for PE and CPT deterrents. The overall kappa for agreement between the raters was .88. Raters met with JMC to review the few differences in coding that arose and to discuss consensus. Several strategies were used to increase reliability and validity of data including standardization of the interview, audio-taping and professional transcription, development of a standardized coding scheme with the aid of computer programs, searching for deviant cases and the use of the transcription techniques of conversation analysis (Popay et al. 1998).

[1]The semi-structured interview is available upon request to the first author.
[2]A full list of the constructs and copy of the survey is available from the first author.

Frequency analysis was run on each of the sub-constructs across the 38 programs to determine which themes were most prevalent throughout the qualitative data. Constructs endorsed in at least 10 % of the interviews were considered for report here. While many of the constructs identified below were mentioned more than 10 % of the time, this was the minimum threshold required for report here. The reported sub-constructs represent the original definitions of the constructs, as assessed.

Using the same coding scheme developed from earlier datasets (Cook et al. 2013; Cook et al. 2014), we also established high and low adoption rates. Program-level adoption was coded using six possible stages of PE and CPT implementation: (a) no adoption, (b) elements of treatment were used, (c) select patients receive the treatment, (d) those patients in a particular track receive the treatment, (e) every patient receives the treatment, and (f) de-adoption. For the purposes here, we coded low adopters as those not adopting or de-adopting the treatments or those using only elements of the EBTs and high adopters as using the treatment with select patients or those in a particular track or every patient received the EBT.

Results

Several themes mapping onto five constructs of the Rogers–Greenhalgh model emerged as especially relevant to implementation from the perspective of VA residential PTSD providers. There was some overlap in predictors to PE and CPT. However, there were also some uniquely influential themes to CPT implementation. A descriptive narrative of the findings with supporting quotations is presented below. Table 2 contains definitions of the sub-constructs and further quotations.

Perceived Characteristics of the Innovation

A high degree of compatibility between the treatment and providers' prior practice was reported as influential to CPT implementation, "that [CPT] was very much in line with my own beliefs and professional opinions… it ended up being a very natural fit." This sentiment was echoed particularly amongst providers who were younger and had more recently completed graduate school as many had been exposed to cognitive-behavioral therapies through their recent education and training. Many providers said CPT represented a streamlined version of the theory and techniques they had already employed and as such the manual felt familiar and easy to learn. Compatibility also refers to the needs of the system, and CPT was reported to be more compatible than PE with existing program parameters, chiefly because of the ability to deliver CPT in group format.

The perceived relative advantage of CPT over other treatments was also identified as facilitating implementation. More specifically, providers credited three elements that led them to perceive CPT as advantageous over other programming: a robust research base, CPT's ability to be delivered in group format and the belief that CPT maximized patient benefit over previously utilized techniques. As explained by one provider at a site where CPT was adopted as the core of the program, "We collected the greatest data off those PCL scores in our program… we had statistically significant results from using CPT… and I think there's tremendous benefit from doing it."

The ability to observe improvements in patients' symptoms and functioning was said to influence providers' willingness to use CPT. Called by one provider "the proof in the pudding" and echoed by others, "The most important thing is the staff started seeing success… there is nothing like that feeling for a clinician. There is nothing as wonderful as seeing a patient get better." The observability of CPT was also said to be particularly reinforcing amongst providers who noted other challenges to CPT utilization including patients presenting with complicated mental and physical health issues such as traumatic brain injury.

Communication and Influence

Termed by one provider as "curbside consulting," the presence of other local providers trained in and delivering CPT was also considered influential in implementation. Indeed, providers often identified a specific colleague or group of colleagues at their program/facility with whom they strategized about CPT implementation. This social networking occurred both formally (e.g., peer-supervision groups, internal listservs) and informally (e.g., at the "water cooler").

Providers frequently described the residential treatment team as close knit and like a family. Thus the opinions and support of other team members was often persuading, "One of our clinicians here really loves PE and she helped me sustain it when I was in my dark days of thinking does PE really work?"

System Readiness for Innovation

The presence of dedicated time and resources was a perceived predictor of CPT implementation. This was negatively influenced when participants perceived that the resources and support necessary to conduct CPT were not in place. Providers noted organizational-level time and resource difficulties to CPT use such as a lack of sufficient number of staff and specifically, a lack of sufficient number of EBT trained staff. In addition, competing responsibilities such as delivering case management to address patient comorbidities or problems (e.g., substance abuse, domestic violence, etc.) reportedly impeded a program's ability to implement CPT. At some programs, even where there was interest in training and use of CPT, provider buy-in was hindered because of insufficient time and resource support, "I don't think it's that clinicians are resistant to learning new techniques. I think it's that they don't have enough time to implement them."

Conversely, at sites where time and resources were perceived as sufficient to support CPT implementation, providers reported having access to trainings, sufficient time to complete case consultation requirements, and a program structure that accommodated the treatment model. In some instances, this involved major programmatic restructuring (e.g., modifying length of stay, hiring and training new providers, resource-sharing with outpatient programs).

Lack of dedicated time and resources was endorsed by more than a quarter of providers as the biggest factor working against implementation of PE. One provider reported "Everybody knows we're supposed to be doing it, we just don't have the resources right now." Some

providers viewed PE as emotionally resource-intensive for both the patient and provider and felt they needed to limit the number of PE cases they carried at one time. Resource constraints to PE centered on a lack of sufficient number of trained staff, the lack of a group-based PE protocol, and insufficient scheduling flexibility to accommodate 90-min sessions.

Receptive Context for Change

Providers who identified leadership as supporting implementation of CPT described a milieu where leadership actively supported the delivery of EBTs, helping providers receive training (e.g., nominating providers and making sure there was clinical coverage when providers attended trainings or completed consultation cases) and were actively involved in the staff treatment planning and the provision of treatment on the unit. Quoting one provider, “If you don’t have a unit leader who values EBTs, well then people are going to be less likely to use it.”

Programs with the highest degree of CPT implementation (i.e., all appropriate patients receiving the treatment) had leadership support that extended to higher-level administrators within the individual VA facility, “We couldn’t have been able to implement it [CPT] without having the director of our program, the chief of Mental Health Service, even the director of the hospital, really on board with the kind of changes we made here. If you don’t have that support then you’re not given the resources. You’re not given the chance to actually show how it can work.”

Likewise, the positive effect of supportive leadership and vision on PE implementation was reported by many providers. Reasons for the facilitative influence of leadership included breaking down administrative barriers to training and resources (e.g., nominating providers for training, providing scheduling support) and securing program welfare by gaining support from outside interests (e.g., higher level administration). Leaders’ treatment preferences also influenced implementation as evident at one program which delivered PE to nearly 50 % of patients in their trauma-processing track, “Frankly I am more of a PE guy so that has pervaded.”

Link to Degree of Implementation

To examine the links between presence or absence of predictors and implementation, we conducted correlation analyses between implementation and reported predictors at high and low adoption rated sites. We found significant links between CPT implementation and social networks ($r = .34$, $p < .05$) and dedicated time and resources ($r = .37$, $p < .05$). Other predictors approached significance in their links with CPT implementation: relative advantage ($r = .31$, $p = .06$), compatibility ($r = .28$, $p = .09$), and observability ($r = .30$, $p = .07$). For PE, leadership was a predictor of implementation ($r = .32$, $p < .05$). There was no significant link between any of the reported deterrents and implementation.[3]

[3]Further information about these comparisons by level of adoption is available from the first author.

Discussion

This is the first study to qualitatively evaluate the Rogers–Greenhalgh implementation model for use of EBTs in mental health. VA PTSD residential treatment providers' perceptions regarding influencing factors for the use of the two EBTs for PTSD were overlapping and unique. Leadership and vision and dedicated time and resources were perceived to influence implementation of both PE and CPT. Provider perceptions of compatibility, observability and relative advantage, as well as providers' interactions with social networks all reportedly uniquely influence implementation of CPT only.

Our findings are largely consistent with previous research. In a review of predictors related to program implementation of health care innovations, Scheirer (2005) found that crucial factors were: good fit between the practice and the host agency's mission, objectives and routines (i.e., compatibility) and providing benefits to providers or clients that are readily perceived (i.e., observability). Likewise, in a comparative study of two VA treatment settings, Cook et al. (2009a) found that treatment observability, presence of a social network likewise trained in the treatment, and compatibility of the treatment with a provider's prior beliefs and practice, influenced adoption of another EBT for PTSD. Additionally, in a study of over 2,600 psychotherapists, the top reported influences on treatment adoption were social networks (significant mentors and colleagues), compatibility and observability (Cook et al. 2009b).

The presence of an on-site social network was perceived here as influential to CPT. Originating with the work of Granovetter (1973), social network theory posits that individuals are influenced by their degree of connectedness to their colleagues and community. In one of the earliest investigations of diffusion, a new prescription drug was more likely to be adopted by medical doctors who shared a workspace with other physicians who had already prescribed the drug than among those who did not share a workspace (Coleman et al. 1957). A shared work environment likely fosters discussion as well as providing reassurance when trying novel treatments. One implication of our findings is that they suggest the importance of ensuring that groups of trained providers are available and in regular contact in the targeted treatment setting, in order to make adequate personnel available and to increase opportunities for implementation networking and support.

The perception of a treatment as holding relative advantage possibly reflects more than demonstrable therapeutic gains over alternatives. For example, is the EBT perceived as better than what providers are currently doing in terms of economics, social prestige, convenience and satisfaction? Aarons (2004) labeled this as part of an innovation's "intuitive appeal" and it has long been recognized as a consistent factor in influencing implementation (Panzano et al. 2004; Rogers 1962, 2003). Providers in this study identified three elements of CPT that increased its appeal for implementation: a robust research base, the ability to deliver CPT in group format, and the belief that CPT maximized patient benefit over previous programming.

As in prior research, leadership around EBTs was perceived as an important predictor, facilitating adoption when supportive, and hindering adoption when not (Brunette et al. 2008; Kirchner et al. 2004; Panzano et al. 2004; Pogoda et al. 2011). In a qualitative

investigation of implementation of integrated dual disorder treatment, Pogoda et al. (2011) identified three components of facilitative leadership: attitude, priority and action. Similar to the findings in our study, leaders who fostered morale, articulated a clear mission, had a thorough understanding of the intervention, held the treatment team accountable and were active in service delivery were perceived as facilitators of implementation. Conversely, where leadership was viewed as a hindrance to implementation, leaders exhibited focus on "the bottom line" (e.g., productivity, increased billable hours), had uncommitted or indifferent middle and upper management, and suffered from a programmatic failure to understand the fundamentals of the treatment model.

Lack of dedicated time and resources was reported to be a large deterrent to the delivery of both treatments, especially PE. Providers identified an inability to schedule blocks of time to deliver the treatment (e.g., 90-min for PE session), lack of resources (e.g., tape recorders, headphones), and time constraints that required group treatment only. The need for adequate resources is echoed throughout the implementation literature (e.g., Dopson et al. 2001; Horwitz et al. 2010). Although it did not reach significant levels, innovation-system fit (i.e., compatibility of the innovation with the organizational setting and structure) was also noted as both a predictor and deterrent for PE and CPT implementation. In particular, sufficient numbers of providers and a program structure that accommodated treatment requirements (e.g., length of stay) were noted obstacles for PE.

The Rogers–Greenhalgh model may require continued refinement. Many constructs were not frequently identified as predictors of implementation in this study. Some sub-constructs were conceptually difficult to differentiate (e.g., presence of a "champion" versus "change agent"). Additionally, several themes emerged that did not easily map on to Rogers–Greenhalgh model (e.g., patient symptom presentation or treatment preference). Continuing efforts towards operationalization of this model are underway (Cook et al. 2012).

There are several limitations to this investigation. We included only residential VA PTSD treatment programs, which represent a small and distinct faction of VA PTSD care. The predictors identified by these providers may differ from those most salient to other treatment settings. The VA is also uniquely resourced and programs are somewhat standardized across locations, which is likely different from other, non-governmental settings. Although interviews were conducted voluntarily and confidentially, it is possible providers were reluctant to report a lack of implementation or negative aspects of their program. In this sample, in no program was PE available in full to all patients; where PE was utilized, it was often delivered in parts (e.g., in vivo exposure only; Cook et al. 2014). Further investigation in a sample in which PE is highly utilized is necessary. Lastly, there is some evidence indicating that health care professionals are limited in their understanding of their practice behaviors (Garb 2005). Given the limitations of self-report, more objective, corroborating data would be beneficial in future investigations.

Future investigations should seek to understand influences to implementation among other stakeholders such as patients and then determine whether these are different to the provider reports here. Likewise, more research is needed to investigate whether factors influencing implementation are the same as or different from those influencing sustainability.

Perceptions of innovation attributes are not immutable. With education, consultation or practical hands-on experience, providers may change their perceptions of EBTs. Educational campaigns tailored to stakeholder groups and directed at improving awareness about an EBT's advantage over existing practices have been utilized (Panzano et al. 2004). Findings here help inform the field what are the current perceptions of PE and CPT and thus how these might be changed to facilitate additional delivery. Program developers and on site leadership can use this information to help identify reasons for limited implementation of PE and CPT. Increasing predictors and reducing deterrents may prove beneficial to providers and patients seeking PTSD services. For example, upper level management and leadership may consider surveying providers to identify which of these deterrents to implementation may be present within their setting in an effort to identify areas of improvement. It also seems that program evaluation could demonstrate the benefits to providers and to leaders who are focused on increasing efficiency in order to persuade them to make more resources available.

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Table 1

Provider report of frequency of predictors to CPT and PE implementation

Construct	Operational definition	CPT present		CPT absent		PE present		PE absent	
		n	%	*n*	%	*n*	%	*n*	%
Relative advantage	Degree to which the innovation is considered superior to existing practices	21	10.6	5	2.5	11	5.6	7	3.5
Compatibility	Innovations' consistency with existing values, experiences, and needs of adopter and system	31	15.6	14	7.1	10	5.1	5	2.5
Complexity	Level of difficulty to understand and use the innovation	7	3.5	11	5.6	0	0	5	2.5
Trialability	Ability to experiment with the innovation on a limited or trial basis	3	1.5	0	0	0	0	2	1.0
Observability	Innovations' results are observable to others	21	10.6	2	1.0	14	7.6	2	1.0
Potential for reinvention	Ability to refine, elaborate and modify the innovation	13	6.6	1	.51	2	1.0	1	.51
Risk	Risk or uncertainty of outcome associated with the innovation	0	0	0	0	0	0	5	2.5
Technical support	Available support components (e.g., training, manuals, consultation help desk)	10	5.0	8	4.0	4	2.0	2	1.0
Needs	Observed or experienced deficit in an adopter's practice or organizational setting	2	1.0	0	0	1	.51	0	0
Motivation	Adopter's interest and willingness to learn new things	11	5.6	9	4.5	3	1.5	6	3.0
Values and goals	What adopters place value in and what are their intended goals for treatment	0	0	1	.51	0	0	0	0
Tenure	Length of employment in setting and in field	2	1.0	6	3.0	2	1.0	5	2.5
Social networks	Structure and quality of social network, both formal and informal	28	14.1	0	0	7	3.5	1	.51
Peer opinion leader	Internal member of the social network able to exert influence on providers' beliefs and actions through representativeness and credibility (can be positive or negative)	2	1.0	1	.51	4	2.0	0	0
Marketing	Process of promoting, selling and distributing a treatment	0	0	2	1.0	0	0	0	0
Expert opinion leader	Senior or high status formal authority with reputable expertise	6	3.0	0	0	4	2.0	3	1.5
Champions	Individuals who support and promote the innovation through its critical stages	0	0	1	.51	1	.51	0	0
Size/maturity	Number and experience of providers; date of program inception	1	.51	0	0	0	0	4	2.0
Slack resources	Actual versus spent budget and/or the total potential hours each provider is available versus actual time spent working	0	0	5	2.5	0	0	0	0
Preexisting knowledge/skill base	Adopters' level of preexisting knowledge and skills	2	1.0	0	0	0	0	0	0
Leadership and vision	Style of leadership and presence of identified and articulated trajectory with guided direction toward implementation	22	11.1	13	6.6	19	9.6	8	4.0
Managerial relations	Relationship between staff and program leadership	4	2.0	0	0	5	2.5	1	.51
Enablement of knowledge sharing	Creation of venues for sharing information	0	0	19	9.6	0	0	0	0
Clear goals and priorities	Explicitness of organizational purposes and aims	9	4.5	5	2.5	3	1.5	5	2.5
High quality data capture	Utilization of context specific data in implementation process	4	2.0	1	.51	0	0	1	.51
Tension for change	Perceived need for change to an organization's current provision of services	4	2.0	5	2.5	5	2.5	3	1.5

Construct	Operational definition	CPT present		CPT absent		PE present		PE absent	
		n	%	*n*	%	*n*	%	*n*	%
Innovation-system fit	Compatibility of the innovation with the organizational setting and structure	16	8.1	8	4.0	3	1.5	17	8.6
Power balances	Relative power of groups invested in implementation (e.g., program staff, director, management)	0	0	0	0	0	0	0	1.0
Dedicated time and resources	Available means needed to implement an innovation (e.g., funding, time, access, administrative support, etc.)	29	14.6	32	16.2	10	5.1	53	26.8
Monitoring feedback	Providers' formal and informal opinions on efforts to implement	0	0	4	2.0	0	0	2	1.0
Sociopolitical climate	Social and political factors within the organization affecting implementation	1	.51	3	1.5	1	.51	5	2.5
Incentives and mandates	Implicit or explicit inducements, encouragements, or directives to implement	5	2.5	4	2.0	3	1.5	5	2.5
Environmental stability	Status of funding and persistence of goals	0	0	5	2.5	0	0	3	1.5
Hands-on approach by leaders	Direct involvement and oversight of procedure and policy	1	.51	0	0	1	.51	1	.51
Human resources issues	Adequacy of education and training at all levels of the program workforce	4	2.0	16	8.1	0	0	0	0
Internal communication	Process by which information is exchanged between individuals within the program	0	0	3	1.5	0	0	3	1.5
Assessment of implications	Estimation of perceived benefits and consequences of implementation	1	.51	0	0	0	0	0	0
Feedback	Information exchange between program staff and external stakeholders	1	.51	0	0	0	0	0	0
Learning style	Adopter's consistent patterns in perceiving, remembering, judging and thinking about new information	1	.51	0	0	0	0	0	0
Cosmopolitan	Adopter's strong connections with professional network; Engagement and attendance at professional meetings and other informational venues	0	0	5	2.5	0	0	0	0

The following constructs were not endorsed as being a barrier or facilitator of PE or CPT: task issues, nature of knowledge, homophily, boundary spanner, change agents, formalization, differentiation, decentralization, ability to learn and integrate new information, inter-organizational norm-setting and networks, decision-making, skills, learning style, locus of control, tolerance of ambiguity, knowledge-seeking, external communications and reinvention

CPT cognitive processing therapy, *PE* prolonged exposure

Table 2

Perceived predictors of CPT and PE implementation

Sub-construct	Definition	Sample quotation
Presence		
Compatibility	Innovations' consistency with existing values, experiences, and needs of adopter and system	"When we first did it [CPT] I thought that it was a good fit for us. It looked right immediately… because it was really consistent with a lot of the things we were already doing"
Relative advantage	Degree to which the innovation is considered superior to existing practices	"I think it's extremely valuable in the residential program. We've had a number of vets who had gone through the program three to 10 years ago who heard about CPT in the PTSD outpatient groups they're in and they want to come back just because they heard that it's much more valuable"
Observability	Innovations' results are observable to others	"Seeing that your patients get better is important. If you are successfully able to use the protocols and see that people do improve then that becomes reinforcing and you want to keep utilizing it"
Social networks	Structure and quality of social network, both formal and informal	"I think, quite realistically, the best support that one can have in implementing these protocols is to have other clinicians in the clinic who utilize them"
Dedicated time and resources	Availability of means needed to implement an innovation (e.g., funding, time, access, administrative support, etc.)	"I mean this system is fully in support of EBTs. It's certainly not an issue within clinics or divisions of having managerial or support from directors and scheduling staff or time built into schedules for conference calls. That's not an issue"
Leadership and vision	Style of leadership and presence of identified and articulated trajectory with guided direction toward implementation	"But when I got here you know they [Leadership] said you got to do it [PE] this way, but we're going to support you. We're going to give you the time. You're going to have the credit to do it the way it's supposed to be done. So there was full backing behind it and that was really, really a breath of fresh air"
Absence		
Dedicated time and resources	Availability of means needed to implement an innovation (e.g., funding, time, access, administrative support, etc.)	"I think the most difficult one though is the resource intensity of PE and that's been real difficult. It's been real difficult for staff to have enough… You can't carry a lot of those people on your caseload because you just don't have the available time to see them at the frequency and intensity that they need admissions"