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# Web-Based Training for an Evidence-Supported Treatment: Training Completion and Knowledge Acquisition in a Global Sample of Learners

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## Abstract

The purpose of this investigation is to describe the characteristics of professional and preprofessional learners who registered for and completed TF-CBTWeb, a modular, web-based training program designed to promote

the dissemination of Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) and to demonstrate the feasibility of this method of dissemination. Between October 1, 2005, and October 1, 2012, a total of 123,848 learners registered for TF-CBTWeb, of whom 98,646 (79.7%) initiated the learning activities by beginning the first module pretest. Of those, 67,201 (68.1%) completed the full training. Registrants hailed from 130 countries worldwide, and they had varied educational backgrounds, professional identities (both professional and preprofessional), and a range of experience working with child trauma victims. Learners who were from the United States, students, those with master's degrees, and those with fewer years of experience working with child trauma victims tended to have the highest course completion rates. Learners displayed significant increases in knowledge about each component of TF-CBT, based on module pretest and posttest scores. The advantages and limitations of this web-based training program evaluation are discussed, while important implications for the use of web-based trainings are reviewed.

## Keywords

TF-CBTWeb, web-based training, dissemination, child maltreatment, professional, preprofessional

Millions of children in the United States experience abuse and are exposed to violence each year (Finkelhor, Ormrod, Turner, & Hamby, 2005; Finkelhor, Turner, Ormrod, & Hamby, 2009; Kilpatrick et al., 2000; Saunders & Adams, 2014). Results from the National Survey of Children's Exposure to Violence, a nationally representative sample of 4,549 children and adolescents, indicated that 60.6% experienced or were exposed to some form of violence in the previous year, including physical abuse, sexual assault, witnessing violence in the community or the home, and other forms of victimization (Finkelhor et al., 2009). Considerable research has found that children exposed to abuse, neglect, and violence are at increased risk for developing serious emotional and behavioral problems including post-traumatic stress disorder (PTSD), depression, delinquency, and problematic substance use (Cisler et al., 2012; Danielson et al., 2009; Leiter, 2007; Macdonald, Danielson, Resnick, Saunders, & Kilpatrick, 2010; Senn, Carey, & Venable, 2008).

Fortunately, the field of child maltreatment has developed and evaluated an array of evidence-supported treatments (ESTs) and promising practices for treating children who have significant problems related to abuse, neglect, and violence (Chadwick Center for Children and Families, 2014; Reece, Hanson, & Sargent, 2014; Substance Abuse and Mental Health Services Administration, 2014). Unfortunately, many children who experience mental health problems as a result of these adverse experiences are unlikely to receive services that are evidence-supported (Allen, Gharagozloo, & Johnson, 2012; Allen & Johnson, 2012; Borntreger, Chorpita, Higa-McMillan, Daleiden, & Starace, 2013; Burns et al., 2004). There are numerous reasons for this gap between known effective interventions and usual service delivery (Institute of Medicine, 2001). A primary one is a workforce that generally is not properly equipped to deliver ESTs.

Across the mental health professions (e.g., psychiatry, psychology, and social work) generally, many training programs fail to provide students with didactic training, clinical experiences, and competent clinical supervision in ESTs, and students pursuing master of social work and doctor of psychology degrees received the least amount of combined didactic training and supervision in ESTs (Weissman et al., 2006). Furthermore, numerous barriers prevent students and practicing clinicians from obtaining didactic training in ESTs. For example, the sequential nature of graduate-level training, the need for training programs to cover many content areas in a short amount of educational time, the fact that many training faculty members may have limited exposure to ESTs themselves, and underlying tensions between science and practice that exist in many training programs likely limit student exposure to didactic training in ESTs (Addis, 2000, 2002; Heck & Smith, 2014). Among practicing clinicians, time constraints, the high cost of training, negative beliefs about ESTs (Aarons,

2004), and a lack of institutional or organizational support for continuing education are barriers to obtaining didactic training (Addis 2002; Foa, Gillihan, & Bryant, 2013; Shafran et al., 2009). Additional tools are needed to address these barriers to training.

### Online Training and the Development of TF-CBTWeb

With the limited access to ESTs for victims of child maltreatment and the aforementioned barriers to training in mind, the National Crime Victims Research and Treatment Center (NCVC) at the Medical University of South Carolina collaborated with the developers of Trauma-Focused Cognitive-Behavioral Therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2006) to create TF-CBTWeb ([www.musc.edu/tfcbt](http://www.musc.edu/tfcbt); Smith & Saunders, 2005). TF-CBTWeb is an online educational course featured by the National Child Traumatic Stress Network for mental health professionals and students interested in learning TF-CBT. TF-CBT was selected as the intervention for this training course because it is one of the most well-supported interventions with applicability to multiple forms of childhood trauma. Numerous randomized controlled trials exist to support the efficacy of TF-CBT for children who have PTSD-related symptoms, including depression and behavior problems (see Cary & McMillen, 2012, for review).

TF-CBTWeb was developed to provide a basic introduction to the treatment components, techniques, and procedures in order to enhance in-person training and serve as a resource where providers could review core components of the treatment and acquire materials (e.g., handouts, work sheets, etc.) that could be used during treatment (see Cohen & Mannarino, 2008; NCVC, 2007, for information about the development of TF-CBTWeb). TF-CBTWeb was intended to be particularly relevant for frontline treatment professionals early in their careers, or in training, who were developing practice skills and competencies.

Within the medical and nursing professions, descriptive studies of online training programs frequently appear in the peer-reviewed literature (see Curran & Fleet, 2005; Griscti & Jacono, 2006, for reviews). Within the mental health professions, online trainings have been used within the context of dissemination and implementation research and effectiveness studies (Dimeff et al., 2009; Weingardt, Cucciare, Bellotti, & Lai, 2009). Dimeff and colleagues (2009) compared the effectiveness of a 20-hr web-based dialectal behavior therapy skills training with instructor-led and manual-only conditions; and of the 59 clinicians randomly assigned to the web-based training condition, 36 reported completing at least 80% of the web-based training. Short, Surprenant, and Harris (2006) evaluated a web-based intimate partner violence educational program designed for primary care physicians; of the 44 physicians randomized to the web-based training condition, 23 completed the minimum 4 hr of training.

Distance education by way of massive online open courses (MOOCs) is a growing, yet controversial (Canavan, 2013), trend within institutions of higher education. Research indicates that across a wide array of topics course completion rates tend to be low ranging from 2% to 14% depending upon course type, length, workload, and how completion is defined (Perna et al., 2013). However, we are unaware of any studies that describe a web-based training course aimed at facilitating the widespread dissemination of an EST. Furthermore, the demographic and educational characteristics of those who would engage in such a course are unknown. Finally, web-based educational courses are often criticized for having low completion rates (Liyanagunawardena, Adams, & Williams, 2013), but little is known about whether mental health professionals will complete such courses and the factors that distinguish completers from noncompleters within this context.

### Objectives

The first objective of this investigation is to describe and compare the characteristics of learners who registered for, initiated (i.e., completed the initial pretest), and completed TF-CBTWeb. The second objective is to evaluate

the usage of TF-CBTWeb by examining initiation and completion rates and evaluating whether differences in these rates exist based upon learners' educational backgrounds, professional identities, years working with child trauma victims, and U.S. versus international status. Because TF-CBTWeb was developed for busy, frontline mental health practitioners in the United States (NCVC, 2007), rates of initiation and completion were expected to be lower among persons outside the target audience (e.g., persons living outside the United States, non-English speakers, and medical professionals). The third and final objective of this investigation is to evaluate the effectiveness of TF-CBTWeb in producing knowledge acquisition pertaining to the treatment of child traumatic stress. Specifically, we predicted that learners, including those who completed the entire training and those who initiated the training but failed to complete the entire program, would display significant increases in knowledge using a pretest to posttest assessment of knowledge acquisition.

## Method

### The TF-CBTWeb Course

TF-CBT (Cohen et al., 2006) is a components-based intervention for youth and at least one nonoffending caregiver. TF-CBTWeb presents information about each treatment component in a modular format. Thus, 10 modules comprise the training: (1) Psychoeducation, (2) Stress Management—Controlled Breathing, (3) Stress Management—Relaxation Training, (4) Stress Management—Thought Stopping, (5) Affect Expression and Modulation, (6) Cognitive Coping, (7) Creating the Trauma Narrative, (8) Cognitive Processing, (9) Behavior Management Training, and (10) Parent–Child Sessions. Notably, each module begins with a four-question pretest and ends by asking the same four questions as a posttest.

Each module also contains a video introduction to the techniques being taught, a description of the techniques and step-by-step instructions for implementing them (including sample scripts for introducing techniques to clients), multiple video demonstrations of the techniques, suggestions for homework or follow-up exercises, cultural considerations for using the technique with clients from diverse backgrounds, discussion of common challenges to implementing the techniques, and directions for how to involve parents or guardians in the therapeutic process.

Mental health professionals who seek formal training in TF-CBT are required to complete TF-CBTWeb before attending in-person training conducted by the treatment developers or their approved trainers. In addition, some universities and other training programs have adopted it as a requirement for their coursework. Thus, it is likely that for many learners, participation in TF-CBTWeb occurs within the broader context of training or education in TF-CBT. Because of this, participation in TF-CBTWeb is likely to reflect an early, if not initial, exposure to the components of the intervention. However, the course does not formally assess how learners heard about the course or their specific reasons for registering, and unlike many MOOCs, learner performance in TF-CBTWeb is not graded.

### Participants

A total of 123,848 learners registered for TF-CBTWeb between October 1, 2005, and October 1, 2012. Based on an analysis of a preliminary data set (NCVC, 2007) indicating that the median number of days from registration to completion was 18, the data used in this analysis were downloaded 18 days after the evaluation period ended to provide those who registered near the end of the evaluation period time to complete the training.

### Measures and Procedure

Learners provide descriptive information as part of the course registration process, including first and last name, state, country, work or school affiliation, position title, and educational background. The registration form also queried the professional discipline and years of experience working with child trauma victims. Learner data

regarding registration information, answer choices for all pretest and posttest questions, and module completion were automatically recorded in a learner database that is accessible only to the investigators. Pretest and posttest scores were calculated for each module. Change in percentage of correct answers from pretest to posttest served as the measure of knowledge acquisition. Before receiving their certificate of completion, learners who complete the training program are asked to complete a 20-item satisfaction survey.

## Analytic Strategy

To address the first objective, frequency counts were calculated to describe characteristics of learners in the analytic sample. To address the second objective,  $\chi^2$  tests of independence were calculated to determine whether differences in training initiation and completion among learners existed based upon educational background, professional identity, years of experience working with child trauma victims, and U.S. versus international learner status. To address the third study objective, 19 paired samples *t*-tests were calculated using learners' pretest and posttest scores to determine whether they acquired knowledge as a result of the training. Analyses were conducted separately for learners who completed the program and for those who initiated the training but failed to complete the program (i.e., the "intent-to-train" sample). Follow-up analyses were then conducted to compare the course completers and the intent-to-train sample's pretest and posttest scores. These analyses were conducted to determine whether the intent-to-train sample performed better, worse, or similar to course completers. To control for experiment-wise error, the significance level for analyses was set at  $p < .001$  (or  $.05/46$  comparisons).

## Results

### Learner Characteristics

Among the sample of learners who registered for the training, social work was the dominant profession represented (41.0%,  $n = 50,819$ ) followed by counseling (26.4%,  $n = 32,660$ ), psychology (17.5%,  $n = 21,629$ ), marriage and family therapy (9.0%,  $n = 11,177$ ), medical/psychiatry (1.8%,  $n = 2,205$ ), and nursing (0.9%,  $n = 1,149$ ). Approximately 3% of learners ( $n = 4,209$ ) selected the "other" option to reflect their professional identity. The majority (74.1%,  $n = 91,710$ ) of learners reported that their highest degree was a master's degree. An additional 15.6% ( $n = 19,307$ ) were pre-master's students in mental health training programs. Doctoral and medical degrees were held by 8.5% ( $n = 10,571$ ) and 1.8% ( $n = 2,260$ ) of learners, respectively. With respect to years of experience working with child trauma victims, almost two thirds (62.7%,  $n = 77,704$ ) of the learners in the analytic sample had less than 5 years of experience and nearly one fifth (19.6%,  $n = 24,229$ ) had between 5 and 10 years of experience. Very experienced learners, those with 10 to 20 years (12.1%,  $n = 14,932$ ) and those with 20 or more years (5.6%,  $n = 6,983$ ), were also represented.

Within the sample, 91.8% of learners reported being from the United States ( $n = 113,651$ ) or a territory of the United States (e.g., Guam, Puerto Rico, etc.). In addition to the United States, learners came from 130 countries around the world. The following countries had more than 100 learners represented in the database: Canada ( $n = 3,594$ ), Australia ( $n = 1,442$ ), United Kingdom ( $n = 616$ ), Israel ( $n = 602$ ), Sweden ( $n = 481$ ), Germany ( $n = 393$ ), the Netherlands ( $n = 309$ ), Norway ( $n = 242$ ), Japan ( $n = 168$ ), Singapore ( $n = 166$ ), Belgium ( $n = 164$ ), Ireland ( $n = 149$ ), New Zealand ( $n = 127$ ), and China ( $n = 111$ ).

### Use of TF-CBTWeb

Overall, 67,201 learners completed all 10 modules of the training course. Completers represented 54.3% of all those who initially registered for the course and 68.1% of those that completed the pretest of the first module. The average number of days from registration to completion was 71.87 with a median of 11 days and a mode of 1 day. Of the learners who completed the course, 69.1% did so within 1 month, 90.2% completed within 6 months, and 94.7% completed within 12 months. Notably, 79.7% ( $n = 98,646$ ) of the registered learners

completed the Module 1 pretest and started the training. Thus, the interval between registration and the first pretest represents the point where the greatest number of learners discontinued the training or perhaps opted not to engage in the training. Four  $\chi^2$  tests of independence were calculated to identify factors associated with training course initiation based on the completion of the Module 1 pretest (see Table 1). Statistically significant associations ( $p < .001$ ) between each learner characteristic and training initiation were detected. In the paragraph subsequently, the percentage of initiators within a given learner characteristic is included parenthetically.

**Table 1.** Clinician Characteristics Associated With Training Initiation.

Clinician characteristics	n Total	n Initiation	% Initiation	$\chi^2$ (df)	p Value
Educational background				594.92 (3)	<.001
Pre-master's student	19,307	15,669	81.2		
Master's degree	91,710	73,790	80.5		
Doctorate	10,571	7,642	72.3		
Medical	2,260	1,545	68.4		
Professional discipline				758.29 (6)	<.001
Counseling	32,660	26,122	80.0		
Marriage/family therapy	11,177	9,271	82.9		
Nursing	1,149	750	65.3		
Psychiatry	2,205	1,487	67.4		
Psychology	21,629	16,522	76.4		
Social work	50,819	41,388	81.4		
Other	4,209	3,106	73.8		
Years of experience				681.55 (3)	<.001
Less than 5	77,704	63,477	81.7		
5–10	24,229	18,923	78.1		
10–20	14,932	11,232	75.2		
Greater than 20	6,983	5,014	71.8		
Location				1,133.21 (1)	<.001
Outside United States	10,197	6,811	66.8		
Within United States	113,651	91,835	80.8		

Note. Training initiation is defined as completing the Module 1 pretest.

Learners who were pre-master's students (81.2%) and those who held master's degrees (80.5%) initiated training at higher rates than those with doctoral (72.3%) and medical (68.4%) degrees. Next, learners with social work (81.4%), counseling (80.0%), and marriage and family therapy (82.9%) backgrounds demonstrated higher rates of training initiation relative to those from psychology (76.4%), nursing (65.3%), psychiatry (67.4%), and other (73.8%) training backgrounds. A significant association was also detected between years of experience and training initiation, such that those with less than 5 years (81.7%) and those with 5–10 years of experience (78.1%) initiated training at higher rates than those with 10–20 (75.2%) and 20 or more years (71.8%) of experience. Finally, learners from within the United States (80.8%) had higher rates of training initiation relative to those from outside the United States (66.8%).

Of the 98,646 learners who initiated the training, 67,201 (68.1%) completed all 10 modules. Four  $\chi^2$  tests of independence were calculated to examine associations between learner characteristics and training completion among those who initiated the training (see Table 2). Statistically significant associations ( $p < .001$ ) between

learner characteristics and training completion were detected. In the paragraph subsequently, the percentage of completers within a given learner characteristic is included parenthetically.

**Table 2.** Comparisons of TF-CBTWeb Completion Rates by Clinician Characteristics Among Learners Who Initiated the Training.

Clinician characteristics	n Total	n Completed	% Completed	$\chi^2$ (df)	p Value
Educational background				833.43 (3)	<.001
Pre-master's student	15,669	10,812	69.0		
Master's degree	73,790	51,278	69.5		
Doctorate	7,642	4,422	57.9		
Medical	1,545	689	44.6		
Professional identity				1,250.02 (6)	<.001
Counseling	26,122	17,716	67.8		
Marriage/family therapy	9,271	6,722	72.5		
Nursing	750	367	48.9		
Psychiatry	1,487	647	43.5		
Psychology	16,522	10,095	61.1		
Social work	41,388	29,643	71.6		
Other	3,106	2,011	64.7		
Years of experience				126.81 (3)	<.001
Less than 5	63,477	43,958	69.3		
5–10	18,923	12,668	66.9		
10–20	11,232	7,393	65.8		
Greater than 20	5,014	3,182	63.5		
International learner status				2,501.56 (1)	<.001
Yes (Outside United States)	6,811	2,781	40.8		
No (Within United States)	91,835	64,420	70.1		

Note. Training initiation is defined as completing the Module 1 pretest, and training completion is defined as completing the Module 10 posttest.

Notably, learners who were pre-master's students (69.0%) and those who held master's degrees (69.5%) completed the training at higher rates relative to learners with doctoral (57.9%) and medical degrees (44.6%). Also, learners from social work (71.6%), counseling (67.8%), and marriage and family therapy (72.5%) backgrounds had higher rates of completion relative to those from psychology (61.1%), nursing (48.9%), psychiatry (43.5%), and other (64.7%) professional backgrounds. Once again, a consistent association between years of professional experience and training completion was evident, such that those with less than 5 (69.3%) and those with 5–10 (66.9%) years of experience had higher rates of training completion relative to those with 10–20 (65.8%) years and those with 20 or more (63.5%) years of experience. Finally, learners from the United States (70.1%) had a completion rate that was much higher than international learners (40.8%).

### Knowledge Acquisition

Pretest and posttest scores for the 10 TF-CBTWeb modules are presented in Table 3. Differences in the pretest scores of course completers and the intent-to-train sample emerged on four occasions. Specifically, the average pretest score of course completers was significantly higher on Module 1 but significantly lower on Modules 2, 3,



and 6. With respect to posttest scores, the course completers obtained significantly higher scores on all but two of the modules, where no significant differences were detected (Modules 2 and 6).

**Table 3.** Comparisons of Pretest and Posttest Outcomes on Each of the 10 TF-CBTWeb Modules Among Completers and the Intent-to-Train Sample.

Module	Pretest				Posttest			
	Completers n = 67,201 Mean (SD)	Intent-to- train n = 31,445 to 306 Mean (SD)	T	P value	Completers n = 67,201 Mean (SD)	Intent-to- train n = 22,655 to 808 Mean (SD)	t	P value
1	51.22 (23.10)	n = 31,445 49.87 (22.48)	- 8.63	<.001	73.52 (23.00)	n = 22,655 71.00 (23.72)	- 14.14	<.001
2	60.67 (25.91)	n = 17,822 61.89 (25.40)	5.58	<.001	84.04 (20.67)	n = 16,370 83.56 (21.31)	-2.63	.009
3	75.76 (26.16)	n = 14,645 77.26 (25.18)	6.32	<.001	85.34 (19.23)	n = 13,847 84.70 (20.01)	-3.55	<.001
4	37.62 (24.93)	n = 12,965 37.06 (24.25)	- 2.36	.018	64.94 (24.81)	n = 12,371 63.04 (25.32)	-7.82	<.001
5	63.18 (25.41)	n = 9,582 64.05 (24.69)	3.15	.002	78.96 (22.62)	n = 8,545 76.97 (23.62)	-7.60	<.001
6	78.73 (24.91)	n = 7,044 80.47 (24.00)	5.73	<.001	90.55 (17.38)	n = 6,298 90.40 (18.50)	-0.68	.496
7	51.53 (27.02)	n = 5,187 51.99 (27.05)	1.17	.241	71.50 (25.69)	n = 3,940 69.07 (26.20)	-5.78	<.001
8	47.90 (27.04)	n = 2,623 47.94 (26.13)	0.08	.939	78.65 (25.17)	n = 1,904 74.68 (26.00)	-6.77	<.001
9	57.83 (25.11)	n = 1,185 58.76 (24.81)	1.25	.211	88.77 (19.61)	n = 808 84.00 (23.85)	-6.84	<.001
10	57.77 (26.36)	n = 306 55.88 (27.05)	- 1.25	.211	74.41 (24.24)	-	-	-

Note. All mean scores are percentage correct, based on four questions. Participants who initiated the training but discontinued before completing the Module 10 posttest comprise the intent-to-train sample.

Results from the paired samples *t*-tests indicated that significant increases in the learners' scores were observed from pretest to posttest (see Table 4). Using Cohen's (1988) guidelines for interpreting effect sizes, the overwhelming majority of effect sizes fell in either the medium (e.g., Cohen's *d* between 0.5 and 0.8) or the large effect ranges (e.g., Cohen's *d* greater than 0.8) for both the training completers and the intent-to-train sample. For Module 3 (Stress Management—Relaxation Training), the effect size for both the training completers and the intent-to-train sample fell in the small range (e.g., Cohen's *d* between 0.2 and 0.5). The effect sizes for Modules 5 (Affect Expression and Modulation) and 6 (Cognitive Coping) for the intent-to-train sample also fell in the small range. The magnitudes of the effect sizes for the modules were consistent across both samples, with the intent-to-train sample evidencing a slightly smaller effect for knowledge acquisition across all modules relative to the course completers. The modal pretest score was 25 for one module (Module 4), 50 for four modules (Modules 1, 7, 8, and 9), 75 for three modules (Modules 2, 5, and 10), and 100 for two modules (Modules 3 and 6). The modal posttest score was 75 for four modules (Modules 1, 4, 7, and 10) and 100 for six modules (Module 2, 3, 5, 6, 8, and 9). Overall, these findings are consistent with our predictions related to knowledge acquisition.

**Table 4.** Knowledge Acquisition From Pretest to Posttest Among Completers and Intent-to-Train Sample.

	Completers		Intent-to-train	
	n = 67,201		n = 22,655 to 808	
Module	Paired samples t	Cohen's d	Paired samples t	Cohen's d
1	-206.33	0.80	-110.51	0.73
2	-233.63	0.91	-107.94	0.85
3	-99.83	0.40	-37.47	0.32
4	-249.03	0.96	-101.33	0.91
5	-148.36	0.58	-43.55	0.47
6	-137.57	0.54	-35.99	0.47
7	-173.38	0.67	-35.21	0.56
8	-277.73	1.07	-40.39	0.93
9	-310.26	1.22	-27.15	0.96
10	-164.90	0.64	-	-

Note. All *t*-values are significant at the level of  $p < .001$ . Participants who initiated the training but discontinued before completing the Module 10 posttest comprise the intent-to-train sample.

## Discussion

TF-CBTWeb, an online program designed to improve mental health professionals' knowledge of an EST for childhood trauma, was completed by learners from around the world, representing a wide array of educational backgrounds, professional identities, and years of experience working with child trauma victims. This is the first large-scale, online effort to disseminate information about an EST systematically, so it is difficult to contextualize our results within a larger framework. However, within its first 7 years of availability, over 120,000 learners registered and over 67,000 (over half) of those completed the full training. While we view it as a success that so many mental health professionals from around the world were interested in and completed the training course, a more fine-grained analysis of the utilization data suggests a more optimistic view regarding learner usage. Of the 56,640 learners who registered for but failed to complete TF-CBTWeb, 44.5% ( $n = 25,202$ ) never started the training by beginning the first module's pretest. Thus, the overall rate of initial engagement with TF-CBTWeb was 79.7%, which appears to be higher than other web-based educational courses (e.g., MOOCs),

where rates of initial engagement may average almost 50% and range from 27 to 68% depending upon course topic (Perna et al., 2013). We did not assess learner registration motives, so we cannot know whether these individuals were not actually interested in the course, were put off by the sequential nature of the modules, or simply were “checking it out” with no real intention of completion. Thus, a second operationalization for training completion can be calculated by dividing the number of individuals who completed the Module 10 posttest by the number of learners who completed the Module 1 pretest, which yields a completion rate of 68.1%. We believe that this definition provides a more accurate reflection of those individuals who “intended to learn” TF-CBT, and so they formed the sample for the bulk of our learner analyses.

Both methods for defining training completion produce completion rates that are roughly comparable to those obtained in previous studies. For example, Dimeff and colleagues (2009) compared the effectiveness of a 20-hr web-based dialectal behavior therapy skills training with instructor-led and manual-only conditions. Of the 59 clinicians randomly assigned to the web-based training condition, 36 (61%) reported completing at least 80% of the web-based training, which was that study’s criterion for training completion. Short et al.’s (2006) web-based intimate partner violence educational program designed for primary care physicians produced a completion rate of 23 of the 44 (52%) physicians who were randomized to the web-based training condition. The TF-CBTWeb completion rates (54.3% of registrants and 68.1% of training initiators) appear generally comparable to other web-based training programs within the mental health professions and higher than what is typically achieved with MOOCs (Perna et al., 2013). There are notable differences between TF-CBTWeb and MOOCs (e.g., absence of formal grading, homework, online teaching assistants, discussion forums, etc.) and between TF-CBTWeb and other web-based trainings that specifically target mental health professionals within the context of a larger study, which make these comparisons somewhat more complex. Notably, the prior studies have been small-scale, experimental studies targeted at specific provider samples. Our efforts, on the other hand, were much larger in scope and not targeted at a specific type or group of providers. Nor was the opportunity for participation decided by participation in a research study. These differences make the contextualization of our completion rates difficult, and we await future studies of similar programs to make more meaningful comparisons.

Next, consistent with our expectations, learners who were not specifically targeted as learners (e.g., international mental health providers and those from medical backgrounds) evidenced lower rates of training completion. This is not surprising, given that these individuals had lower rates of training initiation. The content and delivery of the training may have been less applicable to learners from outside the United States as a result of cultural, educational, and language differences that influence how childhood trauma is conceptualized and treated within various countries around the globe. Not surprisingly, learners from the medical professions (i.e., psychiatry and nursing) evidenced lower completion rates relative to learners from social work, counseling, marriage and family, and psychology backgrounds. Given the roles played by psychiatrists and nurses in the delivery of mental health care, their reasons for registering for the training may have centered more on acquiring a basic understanding of what TF-CBT entails and less on learning how to implement specific components of the treatment.

An inverse relationship between years of experience working with child trauma victims and training initiation and completion rates were observed, with initiation and completion rates being highest among those with less experience. One explanation for this relationship could be that learners with more experience are also older and less competent or comfortable using web-based technology, which could explain their lower initiation and completion rates. Additionally, because learners with less experience treating child trauma are more likely to be students in mental health training programs, they may have been required to complete TF-CBTWeb by their training program, which could explain why their initiation and completion rates were higher. Also, research suggests that students and interns demonstrate more positive attitudes toward adopting ESTs, relative to more

established mental health professionals (Aarons, 2004), which might also explain the higher completion rate among learners with fewer years of experience treating child trauma. These two explanations would also account for the higher rates of initiation and completion observed among those who endorsed a professional background of pre-master's student (and those who were students in doctoral programs that had already obtained a master's degree when they participated in the training).

An important finding from this study pertains to knowledge acquisition. The results demonstrate that learners' knowledge pertaining to the component skills of TF-CBT increased significantly from pretest to posttest on each of the 10 modules, which was consistent with our prediction. However, some noteworthy differences between course completers and the intent-to-train sample emerged at both pretest and posttest. Specifically, on the Module 1 pretest, the course completers had significantly higher scores than the intent-to-train sample; yet, the opposite was true for the pretest scores for Modules 2, 3, and 6. Also, among those in the intent-to-train sample, the point in the training where the greatest number of learners discontinued was after the Module 1 pretest and before the Module 1 posttest. This, coupled with the fact that the intent-to-train sample had significantly higher scores on the Modules 2 and 3 pretests and a similar score on the Module 2 posttest could suggest that TF-CBTWeb may be a poor match for some learners who were interested in learning about TF-CBT but ultimately discontinued early in the training process. Although reasons for discontinuing TF-CBTWeb cannot be discerned from the available data, a possible interpretation of the differential pretest/posttest outcomes on the first three modules is that learners with too much and too little foundational knowledge about the treatment of childhood trauma victims may be likely to discontinue TF-CBTWeb. Specifically, those with too little knowledge may perceive the training as too difficult/complex and discontinue quickly, whereas those with more advanced knowledge may view the training as too basic but advance further into the program before they discontinue. That being said, the modal scores from the pretests and posttests suggest that the difficulty of the questions and the four-question pre-post testing format was generally appropriate for the population of learners who completed TF-CBTWeb.

## Limitations

The present study represents the first large-scale evaluation of the TF-CBTWeb educational training program, and the results should be interpreted with the following limitations in mind. First, the results are constrained as a consequence of the limited amount of background, demographic, and educational/professional data collected from learners. Thus, it is possible that other important individual (e.g., age, attitudes toward ESTs, gender, native language, race/ethnicity, etc.) and systems-level (e.g., agency or employer support for training in ESTs, mandated training by an agency, employer, or mental health training program, etc.) variables may influence completion rates and knowledge acquisition. Second, in the absence of random assignment to TF-CBTWeb or a control condition, causal claims cannot be made as to effectiveness of TF-CBTWeb in producing sustainable increases in knowledge about treating childhood trauma symptoms using TF-CBT. Furthermore, web-based trainings such as TF-CBTWeb can support the acquisition of knowledge. However, we have no information to date regarding TF-CBTWeb completion and the acquisition of relevant clinical skills for delivering TF-CBT with fidelity. The literature indicates that declarative knowledge (knowing "about" something) does not automatically transfer to procedural knowledge (knowing "how to do" something; Addis, 2002; McHugh & Barlow, 2012). This is one of several issues that training programs like TF-CBTWeb must address in the future.

## Implications and Future Directions

Clearly, TF-CBTWeb is, in part, responsible for the global dissemination of an EST for childhood trauma symptoms. Research consistently demonstrates that didactic training alone is insufficient in producing clinicians who can competently provide ESTs with fidelity (King et al., 2002; Sholomskas et al., 2005). Thus, the current gold standard approach to disseminating ESTs is to provide didactic training and ongoing coaching or supervision

(McHugh & Barlow, 2012). However, this model taxes the resources of clinicians who may lack the financial means or agency/employer support to attend in-person trainings, as well as the resources of trainers, who may not have sufficient time to provide a large number of trainees with regular coaching and supervision in an EST. Promising research indicates that web-based trainings may be able to augment or supplement this intensive approach. Using a “fairly rudimentary” (p. 113) web-based training that consisted mostly of text and did not utilize multimedia features (e.g., streaming video clips), Sholomskas and colleagues (2005) found that clinicians assigned to a treatment manual plus web-based training condition evidenced comparable rates of adherence and skill to clinicians in an intensive 3 day didactic training plus 3 hours of telephone-based supervision and superior rates of adherence and skills relative to clinicians in a treatment manual-only condition. Thus, the future of web-based trainings in the dissemination of ESTs for mental health conditions appears promising.

Future research is needed to elucidate best practices for designing and integrating web-based trainings into our models of intervention dissemination. To that end, a better understanding of the factors associated with a failure to initiate or complete web-based trainings is needed. Currently, efforts are underway to survey learners who failed to initiate or complete TF-CBTWeb in order to inform the design and enhance the effectiveness of future training programs. Ideally, these results will illuminate ways to engage and retain learners who are the intended targets of training programs, while also identifying whether there are unique (and likely unmet) needs of professionals who are not the intended targets of the training program, which could be addressed in future web-based training programs.

A second line of research should also investigate whether web-based training programs, such as TF-CBTWeb, can reduce the amount of time spent in didactic training without compromising knowledge and skill acquisition. Furthermore, web-based trainings may enhance the quality of didactic training by covering the “nuts and bolts” of an intervention, which could allow for additional time to be spent helping trainees learn to tailor the treatment to meet the unique needs of the individual client. Technological advancements that could be incorporated into training programs like TF-CBTWeb might allow for the practice of clinical skills, with feedback provided either by a remote trainer or by built-in, computer-based models of expert treatment delivery (e.g., Carpenter, Osterberg, & Sutcliffe, 2012). As computer technology advances, the feasibility of such complex enhancements to training becomes increasingly tantalizing (Heck & Smith, 2014).

Web-based trainings have the potential to shape how we educate future mental health professionals in the United States and around the world. In the United States, such programs offer opportunities for continuing education to help ensure that practicing mental health professionals can maintain up-to-date knowledge about ESTs. Furthermore, faculty within our training programs cannot reasonably be expected to have expertise in every EST that is available, which means that web-based trainings can provide clinicians in training with exposure to ESTs that they might not otherwise receive within the classroom. Next, in developing nations where persons without advanced degrees are often the providers of mental health services, web-based trainings can facilitate the dissemination and implementation of ESTs. Expert trainers residing in countries where ESTs are developed and tested may be able to use web-based training programs to train professional mental health providers in developing countries. Those who receive such training may then be able to disseminate ESTs to others who may not have formal clinical training, as well as to those who live in remote areas with limited Internet access. Overall, research and development in the area of web-based training could foster the global dissemination of ESTs and be an important tool in reducing the global burden of mental illness.

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