Journal of Anxiety Disorders 68 (2019) 102120

Contents lists available at ScienceDirect

Journal of Anxiety Disorders

journal homepage: www.elsevier.com/locate/janxdis

Focus Article

Examining patterns of dose response for clients who do and do not complete cognitive processing therapy

Samantha C. Holmes[a,b], Clara M. Johnson[c], Michael K. Suvak[d], Iris Sijercic[e], Candice M. Monson[e,1], Shannon Wiltsey Stirman[c,f,*,1]

[a] Yale School of Medicine, Department of Psychiatry, United States
[b] University of Akron, Department of Psychology, United States
[c] National Center for PTSD, Dissemination and Training Division, United States
[d] Suffolk University, Department of Psychology, United States
[e] Ryerson University, Department of Psychology, Canada
[f] Stanford University, Department of Psychiatry and Behavioral Sciences, United States

ARTICLE INFO

Keywords:
Dropout
Treatment outcomes
Posttraumatic stress disorder
Trauma-focused therapy
Cognitive processing therapy

ABSTRACT

Trauma-focused therapies, including Cognitive Processing Therapy (CPT; Resick et al., 2016), are effective at reducing clients' PTSD symptoms. A limitation to these treatments, however, is client completion of them. The current study examined temporal patterns of treatment non-completion and the relationships among non-completion, PTSD, and overall mental health functioning outcomes, among clients in a randomized controlled CPT implementation trial. Two models of symptom change were tested: 1) dose-effect model (i.e., clients uniformly improve with additional sessions at a negatively accelerating rate); and 2) the good-enough level model (i.e., clients remain in therapy until they have achieved sufficient improvement, thus clients who attend fewer sessions improve at quicker rates). Results indicated that 42% of clients did not complete treatment, with most discontinuing between sessions two and five. Data did not fit the dose-effect or good-enough level model. Rather, clients who improved at a greater rate in their PTSD symptoms and overall mental health functioning attended *more* sessions. The average client had the best outcomes when they completed all 12 sessions. Identifying clients who may be at risk for discontinuing treatment, and making a concerted effort toward retaining them, is imperative to reduce non-completion rates and ultimately improve client outcomes.

1. Introduction

1.1. Treatment non-completion in cognitive processing therapy

Posttraumatic stress disorder (PTSD) is a relatively prevalent mental health condition with high levels of comorbidity and impairment across numerous domains (Kessler, 2000). Fortunately, there is evidence that individuals who complete trauma-focused therapies (TFTs), including Cognitive Processing Therapy (CPT; Resick, Monson, & Chard, 2016), experience decreases in PTSD symptoms (Asmundson et al., 2019; Bass et al., 2013; Chard, 2005; Forbes et al., 2012; Monson et al., 2006; Resick, Nishith, Weaver, Astin, & Feuer, 2002, 2008; Surís, Link-Malcolm, Chard, Ahn, & North, 2013). A limitation to these treatments, however, is client completion of treatment. Of 4597 Veterans who received CPT through the VA by July 2015, 1131 (24%) did not complete CPT (Cogan, Healy, Chard, & Ashton, 2015). Other studies that examined completion of TFTs found non-completion rates ranging from 16.5% to 72% (DeViva, 2014; Eftekhari et al., 2013; Garcia, Kelley, Rentz, & Lee, 2011; Gutner, Gallagher, Baker, Sloan, & Resick, 2016; Kehle-Forbes, Meis, Spoont, & Polusny, 2016; Niles et al., 2017; Szafranski, Smith, Gros, & Resick, 2017), with a meta-analysis finding an average rate of 36% (Imel, Laska, Jakupcak, & Simpson, 2013; Zayfert et al., 2005). Non-completion is a significant problem in TFTs, because individuals who prematurely discontinue treatment may continue experiencing high PTSD symptoms after terminating treatment (Kehle-Forbes et al., 2016).

One explanation for the considerable range of non-completion rates are contextual differences in the studies. For example, some were

* Corresponding author at: National Center for PTSD, Dissemination and Training Division, United States and Stanford University, Department of Psychiatry and Behavioral Sciences, United States.
E-mail address: sws1@stanford.edu (S. Wiltsey Stirman).
[1] The last two authors share senior authorship on this manuscript.

https://doi.org/10.1016/j.janxdis.2019.102120
Received 1 April 2019; Received in revised form 30 July 2019; Accepted 2 August 2019
Available online 01 October 2019

randomized controlled trials (RCTs) with large samples (e.g., Szafranski et al., 2017), whereas others were smaller program evaluation projects (e.g., Niles et al., 2017). Additionally, differences in non-completion rates may also be accounted for by variations in the way in which non-completion is defined. For example, in RCTs, researchers typically include clients who consented to treatment, but never begin therapy, in their definition of non-completion (e.g., Gutner et al., 2016). Other studies have defined non-completion as ending treatment prior to completing all sessions part of the treatment protocol (e.g., Szafranski et al., 2017) or discontinuing treatment within the first seven sessions (e.g., Mott et al., 2014). Garcia et al. (2011), as well as Zayfert et al. (2005), defined non-completion as clients who discontinued treatment prior to reaching their treatment goals (e.g., no longer met criteria for PTSD), even if that meant continuing beyond the number of sessions required by a TFT protocol.

Regardless of the precise rate, evidence regarding TFT non-completion has caused many to regard treatment non-completion as a serious problem (e.g., Kehle-Forbes et al., 2016; Niles et al., 2017). Najavits (2015) for example, posits that the term "gold-standard," which has historically been used to describe evidence-based TFTs such as CPT, should be reserved for treatments that not only yield clinically significant change, but also demonstrate sufficient retention rates. Others, however, posit that not all non-completion should be treated equally. That is to say, non-completion may not always be a negative outcome; rather, some individuals who do not complete CPT may be early responders to treatment with successful outcomes (Gutner et al., 2016).

Indeed, several recent studies indicate that many participants may not require the full 12 sessions of CPT to achieve favorable outcomes. Galovski, Blain, Mott, Elwood, and Houle (2012) tested a modified version of CPT for which the number of sessions a participant completed was determined by their progress, using PTSD and depression scores on self-report measures, agreement between participant and therapist that treatment goals had been achieved, and negative PTSD status as assessed by the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990). Results demonstrated that 58% of participants met these pre-determined criteria prior to completing 12 sessions, with the average client requiring 7.5 sessions of CPT (Galovski et al., 2012). Szafranski et al. (2017) expanded upon previous research by examining outcomes in clients who did not complete the 12-session protocol due to dropout rather than a priori decisions regarding early completion. Results demonstrated that 36–56% of the clients who discontinued treatment prematurely achieved clinically significant improvement and/or good end-state functioning in PTSD and depression. Notably, however, those who attended more treatment sessions were more likely to attain favorable outcomes.

1.2. Dose-response relationships in therapy: the dose-effect and good-enough level models

One way to theoretically conceptualize CPT non-completion can be found in the growing body of literature on dose-response relationships in psychotherapy. Initially, the predominant model for understanding how clients respond to increasing "doses" (i.e., sessions) of psychotherapy was the dose-effect model (Howard, Kopta, Krause, & Orlinsky, 1986). This model posits that clients continue to improve with additional sessions at a negatively accelerating rate. Stated another way, "the effect of psychotherapy is greater in earlier sessions and increases more slowly at higher dosage levels" (Kopta, 2003, p. 728). The dose-effect model assumes that the effect of additional sessions is equivalent for all clients (Baldwin, Berkeljon, Atkins, Olsen, & Nielsen, 2009). This has been critiqued as a limitation, because it does not allow for individual differences in clients' dose response.

In contrast, the good-enough level (GEL) model assumes that clients tend to remain in therapy until they have achieved sufficient improvement and that, consequently, clients who attend different numbers of sessions improve at different rates (Baldwin et al., 2009). For example, clients who attend fewer sessions may do so because they are improving at a quicker rate, whereas those who attend more sessions may do so because they are improving more slowly and thus, require additional sessions to accomplish their clinical goals. Proponents of the GEL model argue that an individual client's progress over the course of therapy is linear, but that when examining the aggregate trajectory of a sample of clients, the resulting curve is negatively accelerating due to the rapid-responders ending treatment earlier (Barkham et al., 2006). Numerous studies have conducted a direct comparison of dose-effect and GEL models by comparing the fit of an aggregate model (i.e., dose-effect) that averages the rate of improvement across all clients, to a stratified model (i.e., GEL) that accounts for the impact of the number of sessions attended by each client. Studies consistently support the GEL model (Baldwin et al., 2009; Barkham et al., 2006; Falkenström, Josefsson, Berggren, & Holmqvist, 2016; Owen, Adelson, Budge, Kopta, & Reese, 2016; Reese, Toland, & Hopkins, 2011; Stulz, Lutz, Kopta, Minami, & Saunders, 2013). A strength of the literature on dose-response in psychotherapy is the heterogeneity of the studies that have been conducted to examine these models. Specifically, the GEL model has been upheld in a variety of clinical settings (e.g., counseling centers, community-based primary care, psychiatric outpatient clinics), utilizing several different outcome measures, and among clients with a range of presenting clinical concerns (e.g., Baldwin et al., 2009; Falkenström et al., 2016; Stulz et al., 2013). Additionally, the range of sessions attended by clients in these studies often varied considerably (e.g., two to 100; Owen et al., 2016). That being said, the *mean* number of sessions attended by clients in these studies was relatively low (i.e., 6.00–9.04; Baldwin et al., 2009; Falkenström et al., 2016; Owen et al., 2016; Reese et al., 2011; Stulz et al., 2013).

Understanding patterns of dose response for clients engaged in CPT would provide critical information regarding the appropriate dose of treatment needed, which is particularly important given concerns of TFT treatment non-completion. Additionally, it would lend insight to the extent to which clients who do not complete treatment can be considered early responders. However, there are no studies to our knowledge that have tested the dose-response and GEL models within the context of a CPT trial. Further, there are key differences between a CPT protocol and the clinical context in the aforementioned studies (Baldwin et al., 2009; Barkham et al., 2006; Falkenström et al., 2016; Owen et al., 2016; Reese et al., 2011; Stulz et al., 2013) that preclude generalization. First, the dose-response and GEL models have most often been tested in uncontrolled studies in which there is no information regarding the therapeutic interventions. Second, the samples are most often not diagnosis-specific (e.g., Owen et al., 2016; Reese et al., 2011). Consequently, it would be important to test the dose-effect and GEL models within the context of a CPT trial as it is unique in that all clients present with PTSD and there is a predetermined protocol.

1.3. Current study

The current study was designed to: a) examine patterns of treatment discontinuation of CPT in routine care settings, b) investigate clinical outcomes for clients who discontinue, and c) compare the competing dose-effect and GEL models within a randomized controlled implementation trial. Based on the considerable support for the GEL model in other contexts (e.g., Baldwin et al., 2009; Barkham et al., 2006; Falkenström et al., 2016; Owen et al., 2016; Reese et al., 2011; Stulz et al., 2013) and previous studies that suggest that a sizeable portion of CPT clients do not require the entire 12-session protocol (Galovski et al., 2012; Szafranski et al., 2017), it was predicted that the GEL model would demonstrate a significantly better fit to the trajectory of response. In other words, we predicted that clients who attended fewer sessions had improved at a quicker rate than those who attended more sessions.

2. Method

2.1. Participants

2.1.1. Clients

The sample consisted of 188 client participants from a randomized controlled implementation trial comparing different types of post-training CPT consultation strategies in Canada. For more information regarding the parent study, please see Monson et al. (2018) and Stirman et al. (2013). Participating therapists recruited clients with a PTSD diagnosis according to the Diagnostic and Statistical Manual – Fourth Edition (DSM-IV; American Psychiatric Association, 2000) in their routine clinical practice settings. Clients who did not consent to their sessions being audio recorded or for whom CPT was not indicated (i.e., had current uncontrolled psychotic or bipolar symptoms, substance dependence requiring detoxification, risk of imminent suicide or homicide requiring acute care or significant cognitive impairments that precluded participation in therapy) were excluded from the study. Two clients did not have therapist-diagnosed PTSD, but had a PTSD Checklist (Weathers, Litz, Herman, Huska, & Keane, 1993) score above the cut-off (50) and the therapists believed that treatment would be indicated. Additionally, clients were not selected to participate on the basis of endorsing of a specific type of index trauma. Consequently, index trauma varied considerably (e.g., assault, natural disaster, peacekeeping missions, combat, childhood trauma, etc.) Clients with mild to moderate traumatic brain injury, which was reported by clinicians based on clients' medical records, were included in the sample. Fifty two percent of the sample was female and 48% were male with an average age of 39.39 years (SD = 11.27). The majority of the sample was White (88.0%) followed by Indigenous (4.0%), Asian/Pacific Islander, Black (1.7%), Hispanic (0.6%), and 2.9% identified as "other." Most had never enlisted in the military (57.6%), 19.2% were on active duty, and 23.3% were Veterans. For more information regarding the demographic information for the sample, please see Monson et al. (2018).

2.1.2. Therapists

The therapists (n = 80) were providers of mental health care at the Operational Stress Injury clinics, Canadian Forces mental health services or the broader Canadian community who had enrolled in a study to compare three different strategies for training therapists. Forty-one percent of the therapists had a PhD or PsyD, 41% had a Master's degree, 7% had a Bachelor's degree, and 5% had an MD. For more detailed therapist demographics, please refer to Monson et al. (2018). In the parent study, therapists were trained in a CPT workshop and then randomly assigned to one of three consultation conditions: 1) standard consultation by expert-CPT providers without session audio review, 2) tech-enhanced consultation by expert-CPT providers with review of session audio, and 3) No consultation.

2.2. Measures

2.2.1. The Posttraumatic Stress Disorder Checklist (PCL)

The Posttraumatic Stress Disorder Checklist (PCL) is a 17-item, self-report questionnaire that measures symptoms of DSM-IV PTSD on a 5-point Likert scale in the past month (Weathers et al., 1993). A PCL score of 50 or higher has been used as likely indicator of PTSD (e.g., Andrykowski, Cordova, Studts, & Miller, 1998; Lang et al., 2012). The PCL has excellent internal consistency (α = 0.94). At the time of data collection, the DSM-5 had not been released (American Psychiatric Association, 2013). In the current study, internal consistency reliability was .94. Client participants completed the PCL at baseline and after every session.

2.2.2. The Outcomes Questionnaire-45 (OQ-45)

The Outcomes Questionnaire-45 (OQ-45) is a 45-item self-report scale designed to monitor functioning in routine care (Lambert et al., 1996). The OQ-45 includes questions about common symptoms across many different mental disorders on a 5-point Likert scale. A total score of 63 or higher indicates difficulty functioning. The OQ-45 has shown strong internal consistency and test-retest reliability (α = .93; r = .84; Lambert et al., 1996). In the current study, internal consistency reliability was .94. Clients completed the OQ-45 at baseline and at each session.

2.2.3. Treatment non-completion

Therapist participants were responsible for administering and turning in the aforementioned self-report measures. Consequently, the last session a participant was considered to have attended was the last session for which there was a PCL or OQ-45 completed. Clients who did not have these measures through session 12 were considered not to have completed treatment. Inversely, clients who had a PCL and/or OQ-45 completed for session 12 were considered to have completed the treatment.

2.3. Procedures

Local and institutional review boards approved all study procedures and all clients provided informed consent prior to participating (Monson et al., 2018).

2.3.1. CPT treatment

The clients attended 1-h CPT sessions consistent with the CPT manual (Resick et al., 2016). The first session involves psychoeducation on PTSD, the treatment rationale, and the first homework assignment: writing out the way in which the traumatic event has affected the client's life. The next two sessions focus on how situations, cognitions, and feelings interact and the therapist beings to challenge problematic trauma-related appraisals. Therapists delivered the version of CPT that involves a written account of the trauma assigned in session three, referred to in the most recent manual as CPT + A. Following the account review, the therapist uses Socratic dialogue to challenge problematic beliefs, particularly those related to self-blame and guilt. Sessions seven through 12 focus on challenging thoughts associated with trauma-related themes including safety, trust, power/control, esteem, and intimacy.

2.4. Analytic plan

To address the current study's first goal, inspecting timing of when clients discontinue treatment, a life table was constructed to ascertain the number of clients who discontinued treatment at each session. Second, scores on the both the PCL and OQ-45 were used to determine proportions of clients who had attained favorable outcomes, which was defined in three ways: reliable clinically significant improvement (RCSI), good end-state functioning (i.e., ending below the clinical cut-off for the measure), and achieving both of these criteria. Based on formulas developed by Jacobson, Follette, and Revenstrof (1984) and consistent with previous studies (e.g., Lambert, Hansen, & Finch, 2001), a decrease in 14 points on the OQ-45 was considered RCSI and the established clinical cut-off score of 63 or lower was utilized (Lambert et al., 1996). For the PCL, various cut-off scores have been used historically. In the current study, we used the recommended cut-off score of 50 (Weathers et al., 1993) which has been employed by numerous studies (e.g., Andrykowski et al., 1998; Lang et al., 2012). A 10-point decrease on the PCL was considered RCSI based on Jacobson and Truax's (1991) equations that have been calculated and used in other studies (e.g., Monson et al., 2008). Rates of favorable outcomes are presented separately for those who discontinued treatment early (before session 4), mid-treatment (sessions 4–8), toward the end of treatment (after session 8), and those who completed all 12 sessions.

Finally, to compare the dose-effect and GEL models, we conducted

multilevel growth curve models. We utilized a similar approach reported by Baldwin et al. (2009) including both an aggregate and stratified model. The aggregate model represented the dose-effect model and modeled only time (both linearly [i.e., days since baseline] and quadratically [days since baseline squared]), because it was found to fit the data best in the parent study (Monson et al., 2018). It is labeled the aggregate model because it averages the rate of change across sessions, without accounting for the number of sessions attended by each client. The stratified model represented the GEL model. In addition to the main effects of time (both linearly and quadratically) modeled in the aggregate model it also included the main effect of number of sessions attended and the interaction effects between number of sessions attended and both the linear and quadratic rates of change. By evaluating the potential unique contribution of this set of interaction terms, we were able to determine whether the rate of change significantly differed as a function of number of sessions attended (e.g., whether clients who attended less sessions improved at a quicker rate, as is predicted by the GEL).

Baldwin et al. (2009) compared an aggregate model, or unconditional change model, that evaluated the nature of change without any other predictors in the model to a stratified model, which included time, number of sessions, and the time x number of session interaction variables. This approach tested whether the combination of the main effect of time and the time x number of sessions interaction fit the data better than a model with only time (aggregate model). To isolate and test the unique contribution of the time x number of session interaction, we also evaluated an intermediate, main effects, model that included time and number of sessions without the time x number of session interaction terms and compared the segregated model to the main effects model. All three models (i.e., aggregate, main effects, stratified) were run separately for PCL outcomes and OQ-45 outcomes.[2]

3. Results

3.1. Temporal patterns of non-completion

A life table was constructed to examine temporal patterns of discontinuing treatment, (see Table 1). Notably, 58.0% of the sample completed all 12 sessions. Additionally, while it is evident that some clients discontinued between each session, the majority of those who did not complete (55.7%) stopped attending between sessions two and five.

3.2. Favorable outcomes by non-completion timing

3.2.1. PTSD symptoms

Table 2 demonstrates the proportion of clients who attained RCSI and/or good end-state functioning on the PCL, split by whether they discontinued in the beginning (14.7–20.0%), middle (38.1–42.1%), or end of treatment (47.4–47.6%) or completed the full protocol (65.7–69.2%). The vast majority of clients who discontinued early on in treatment did not achieve favorable outcomes; however, a considerable minority (25.0–47.6%) of those who persisted until the middle or late phases of treatment did.

[2] Given that the parent study found support for differences based on consultation groups, the current study also tested a model that contained a three-way interaction of consultation group × number of sessions attended × time; however, the three-way interaction was not statistically significant for either the PCL or the OQ-45. Additionally, we assessed whether initial symptom severity was a moderator of the primary analyses. However, neither the initial severity × number of sessions attended × time three-way interaction including initial PCL severity nor the three-way interaction including OQ-45 severity was significant.

Table 1
Life Table Depicting Treatment Non-Completion by Session Number.

Interval between sessions	Number in treatment	Number who discontinued	Proportion who discontinued (hazard)	Proportion remaining in treatment (survival)	Cumulative proportion remaining in treatment
0-1	188	3	.02	.98	.98
1-2	185	4	.02	.98	.96
2-3	181	17	.09	.91	.87
3-4	164	13	.08	.92	.80
4-5	151	14	.09	.91	.73
5-6	137	1	.01	.99	.72
6-7	136	3	.02	.98	.71
7-8	133	3	.02	.98	.69
8-9	130	7	.05	.95	.65
9-10	123	4	.03	.97	.63
10-11	119	5	.04	.96	.61
11-12	114	5	.04	.96	.58

3.2.2. Overall mental health functioning

Results regarding RCSI and good end-state functioning on the OQ-45 are also in Table 2, split by whether clients discontinued in the beginning (8.8–21.2%), middle (11.8–31.3%), or end of treatment (5.3–35.3%) or completed the entire protocol (28.1–52.4%). Similar to the PCL, the only group in which the majority (52.4%) achieved RCSI were clients who completed treatment. However, ending below the clinical cut-off for the OQ-45 occurred infrequently regardless of the point at which clients discontinued (5.3–28.1%).

3.3. Comparing the dose-effect and GEL models

3.3.1. PTSD symptoms

The results of all 3 models examining PTSD symptoms (i.e., aggregate, main effects, stratified) are depicted in Table 3. The main effect of number of sessions was not significant, Wald $\chi(1) = 3.11$, $p = .08$, meaning the number of sessions clients attended was not associated with their initial level of PTSD symptoms. Although neither the interaction of number of sessions with linear rate of change ($b = .010$, $p = .861$) nor the interaction of number of sessions with quadratic rate of change ($b = -.008$, $p = .098$) were significant independently, the combined effect of the two interactions effects was statistically significant, Wald χ^2 (2) = 6.48 $p = .039$. To interpret the stratified model, the rate of change over time was graphed for each possible number of sessions attended (i.e., 1–12), demonstrating that, on average, clients needed to attend at least 10 sessions to drop below the clinical cut-off for the PCL. To illustrate this effect, we graphed the rate of change for clients who attended five and 12 sessions (see Fig. 1) representing one standard deviation below and above the mean number of sessions attended ($M = 8.95$). Contrary to hypothesis, clients who attended more sessions improved at a *greater* rate than those who attended fewer sessions (see Fig. 1, Table 4).

Following the procedures described by Feingold (2009), to produce an estimate of the effect size of number of sessions on change in PTSD symptoms we used the regression equation to depict the average amount of change for clients completing five sessions ($M\Delta_{PTSD} = -6.47$) and clients completing 12 sessions ($M\Delta_{PTSD} = -7.77$) from pre-treatment to session 5 as an index of effect size. This corresponded to an effect size of $d = -.58$ and $-.70$ (medium to large) for change in PTSD from pre-treatment to session 5 for clients completing 5 and 12 sessions, respectively, which corresponded to a difference of $d = -.12$ (small; Cohen, 1988). Thus, while clients who attended more sessions tended to show larger changes through 5 sessions than clients who attended fewer sessions, this effect at session 5 was small.

3.3.2. Overall mental health functioning

The results of the aggregate, main effect, and stratified models

Table 2
Frequency of RCSI, Good End-State Functioning, and Both on PCL and OQ-45, Split by Timing of Discontinuation.

	PCL			OQ-45		
	RCSI	Below Clinical Cut-off	Both	RCSI	Below Clinical Cut-off	Both
Early Treatment Non-completion	14.7%	20.0%	8.6%	21.2%	8.8%	0.0%
Mid Treatment Non-completion	42.1%	38.1%	25.0%	31.3%	11.8%	11.8%
Late Treatment Non-completion	47.4%	47.6%	26.3%	35.3%	5.3%	5.3%
Completed	69.2%	65.7%	56.6%	52.4%	28.1%	20.7%

Note. RCSI = reliable clinically significant improvement, PCL = Posttraumatic Stress Disorder Checklist, OQ-45 = Outcome Questionnaire-45, Early Treatment Non-completion = discontinued before session 4, Mid Treatment Non-completion = discontinued after session 4 but before session 8; and Late Treatment Non-completion = discontinued after session 8.

Table 3
Multilevel Growth Curve Models Predicting Change in PCL and OQ-45 across Treatment.

Variable	Coefficient					
	PCL			OQ-45		
	Aggregate Model	Main Effects Model	Stratified Model	Aggregate Model	Main Effects Model	Stratified Model
Deviance Statistic	12,168.68	12,165.62	12,162.57	12,393.56	12,391.07	12,385.75
# of Parameters	10	11	13	10	11	13
Intercept	61.20***	64.43***	64.09***	98.41***	104.82***	103.17***
Days	−1.50***	−1.50***	−1.66**	−1.58***	−1.57***	−1.10
Days^2	.03	.03	.12*	.04	.04	.16
#Sessions		−.36	−.32		−.72	−.54
Days X #Sessions			.01			−.06
Days^2 X #Sessions			−.01			−.01

Note. The aggregate model represents the dose-effect model and the stratified model represents the GEL (i.e., good-enough level) model. PCL = Posttraumatic Stress Disorder Checklist, OQ-45 = Outcome Questionnaire-45.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

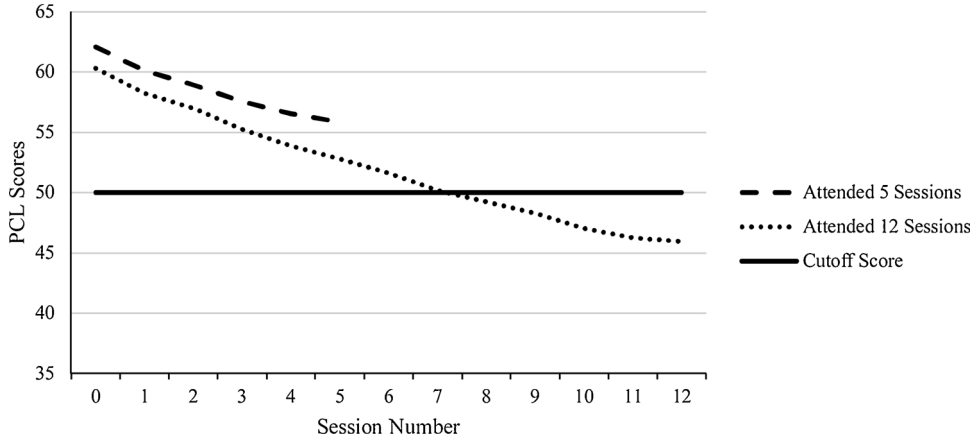

Fig. 1. Change in PCL scores by session for those who attended 12 sessions versus 5 sessions. The cut-off score is depicted by the continuous black line. Session 0 denotes measure collected at baseline. PCL = Posttraumatic Stress Disorder Checklist.

predicting OQ-45 scores are in Table 3. The main effect of number of sessions was not statistically significant, Wald $\chi(1) = 2.34$, $p = .127$, indicating that the number of sessions attended was not associated with clients' pre-treatment scores on the OQ-45. Neither the interaction of number of sessions with linear change of time ($b = -0.06$, $p = .644$) nor the interaction of number of sessions with quadratic change over time ($b = 0.01$, $p = .261$) were significantly predictive but their combined effect was, Wald χ^2 (2) = 7.64, $p = .022$. To better understand the stratified model, we graphed change on the OQ-45 for those who attended five and 12 sessions (see Fig. 2). Contrary to prediction, clients who attended more sessions had a *greater* rate of improvement (see Fig. 2, Table 4). The average amount of change from pre-treatment to session 5 was −4.20 ($d = -.16$) and −8.44 ($d = -.31$) for clients completing five and 12 sessions, respectively, which corresponded to a difference of $d = -.15$ (small; Cohen, 1988).

4. Discussion

Although there is considerable evidence that individuals who complete TFTs, including CPT, experience decreases in PTSD symptoms, treatment noncompletion remains a considerable problem. Consequently, it is imperative to better understand treatment non-completion and its implications. Toward this end, the current study examined temporal patterns of treatment non-completion and assessed clients' dose-response patterns. Generally, results indicate that 42% of clients did not complete treatment, that clients who improved at a

Table 4
Comparison of Change in PCL and OQ-45 scores Based on Treatment Completion Status.

Interval between sessions	PCL		OQ-45	
	Attended 5 Sessions	Attended 12 Sessions	Attended 5 Sessions	Attended 12 Sessions
0-1	−2.1	−2.1	−1.7	−2.3
1-2	−1.2	−1.3	−.9	−1.4
2-3	−1.5	−1.8	−.9	−1.9
3-4	−1.0	−1.4	−.5	−1.5
4-5	−.7	−1.2	−.2	−1.2
5-6		−1.3		−1.3
6-7		−1.5		−1.5
7-8		−1.1		−1.0
8-9		−1.1		−1.0
9-10		−1.5		−1.2
10-11		−.9		−.7
11-12		−.4		−.3

Note. Represents reduction in scores for clients who attended 5 sessions (i.e., one standard deviation below the mean) and 12 sessions (i.e., entire protocol; about one standard deviation above the mean). PCL = Posttraumatic Stress Disorder Checklist, OQ-45 = Outcome Questionnaire-45.

greater rate attended more sessions, and it appears that clients who completed all 12 sessions had the best outcomes.

4.1. Findings and implications

4.1.1. Temporal patterns of discontinuing treatment

In the current study, most clients discontinued treatment between sessions two and five. This is consistent with previous research which found that most clients who discontinued TFT did so by session five (Gutner et al., 2016). At the end of sessions three and four, clients were assigned to produce detailed written accounts of their trauma for homework, an assignment that may be perceived as particularly challenging. As previously mentioned, when the current study was conducted, written accounts were the standard training in CPT. However, based on the results of a dismantling study (i.e., Resick et al., 2008), as well as subsequent research indicating that rates of non-completion were lower and response rates were not significantly different when CPT was delivered without the account, the current CPT manual (Resick et al., 2016) no longer requires the written account as part of the protocol. That being said, the CPT manual still includes the written account as an optional treatment component and it is still implemented by therapists and may confer advantages for some populations (Walter, Dickstein, Barnes, & Chard, 2014). The current results suggest that therapists might consider their clients' relative risk for non-completion when deciding whether to assign the written account. Specifically, when therapists work with clients who they consider to be at a relatively higher risk for discontinuing treatment, it may be prudent to conduct standard CPT without the written account. Additional potential explanations for treatment non-completion are lack of "buy-in" to treatment rationale, logistical barriers to attending sessions, or a lack of encouragement from loved ones, which was shown in a recent study to be highly predictive of dropout (Meis et al., 2019).

4.1.2. Rates of favorable outcomes based on timing of discontinuation

The current study's results regarding rates of favorable outcomes corroborate and extend previous research (Szafranski et al., 2017) by examining outcomes as a function of when clients stopped attending, instead of looking at all clients who discontinued treatment monolithically. Contrary to the supposition that those who discontinue later in treatment may do so because they have already accomplished their clinical goals, on average in this sample, clients who did not complete treatment did not achieve RCSI or good end-state functioning, regardless of the stage of treatment in which they discontinued. By comparison, the average client who completed the protocol achieved RCSI and good end-state functioning with regards to PTSD symptoms and RCSI with regards to overall mental health functioning. In fact, the proportion of clients who achieved both RCSI and good end-state functioning, regarding their PTSD symptoms, more than doubles between late treatment discontinuation (after session 8) and those who complete the protocol. These findings are consistent with those of Rutt, Oehlert, Krieshok, and Lichtenberg (2018) who found a significant completion status by time interaction, indicating that clients who completed TFT had greater reductions in PTSD symptoms than those who did not complete treatment. That being said, the current results did demonstrate that a sizeable minority of clients were able to achieve favorable outcomes without completing the protocol, which is consistent with the results of other studies on TFTs (e.g., Galovski et al., 2012; Szafranski et al., 2017; Wamser-Nanney, Scheeringa, & Weems, 2016). It is, therefore, important for future studies to continue the work started by some researchers (e.g., Wamser-Nanney et al., 2016) and ascertain reliable predictors of which clients will require full TFTs and which may benefit adequately from abbreviated protocols.

It is important to highlight that, while clients achieved favorable outcomes, many did not achieve good end-state functioning in overall mental health functioning as measured by the OQ-45, even after completing CPT. It is possible that more time may be needed after treatment to put skills into practice, improve functioning, and rebuild relationships after recovering from PTSD. It is also possible that since CPT is focused primarily on alleviating PTSD symptoms, additional treatment aimed at simultaneously improving functioning (e.g., Monson & Fredman, 2012) may be appropriate. Future research that includes a longer-term follow-up assessment of functioning will be important to

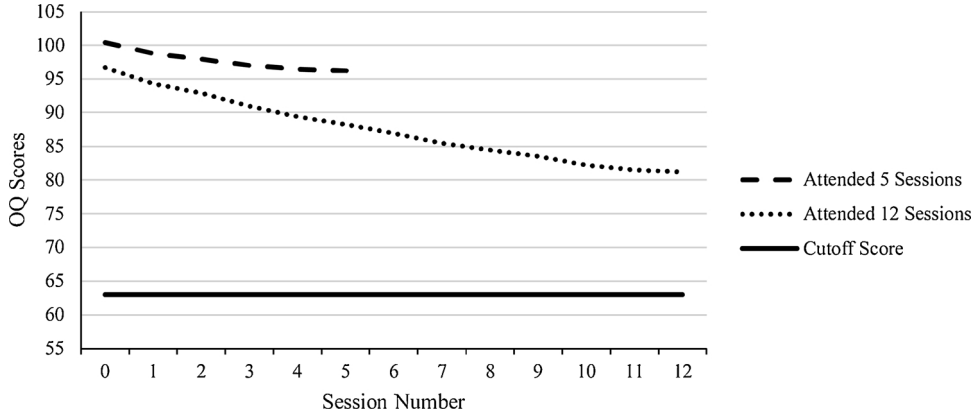

Fig. 2. Change in OQ-45 scores by session split by those who attended 12 sessions versus 5 sessions. The cut-off score is depicted by the continuous black line. Session 0 denotes measure collected at baseline. OQ-45 = The Outcomes Questionnaire-45.

better understand the trajectory of psychosocial recovery.

4.1.3. Dose response and rates of change

The current study's results are inconsistent with previous research that has supported the dose-effect and GEL models (e.g., Baldwin et al., 2009; Barkham et al., 2006; Falkenström et al., 2016; Owen et al., 2016; Reese et al., 2011; Stulz et al., 2013) in that they demonstrate that the greater their rate of improvement, the *more* sessions a client attends. Notably, even though the parent study found significant differences in client improvement based on the consultation group to which their therapist was assigned (i.e., clients of therapists who received standard consultation demonstrated greater improvement than those who did not receive consultation; Monson et al., 2018), the patterns of dose response in the current study did not vary as a function of consultation group.

There are several potential explanations for these disparate results of the current study relative to previous studies on dose response. It is possible that both the sample and treatment differed in important ways from the previous research. First, the current sample comprised clients with PTSD for whom avoidance is a hallmark symptom. This may be a factor that contributes to ending treatment prematurely. Second, the current study is within the context of a CPT study, with a protocol that included a predetermined number of sessions, each with novel therapeutic content. Additional research on how different patterns of symptoms and functioning may impact treatment retention is needed, as the relationships are likely complex, particularly for PTSD. Clients who experienced less early improvement in their PTSD symptoms overall may also have experienced less improvement specifically in avoidance symptoms. Higher levels of avoidance may have corresponded with a decision to discontinue a TFT. Additionally, if clients did not see as much initial change as they may had hoped, they may have opted to leave treatment because they concluded that the therapy was not sufficiently helpful. It may also be the case that intra- or interpersonal psychosocial strengths (i.e., adaptive coping strategies, social support) allowed some clients both to persist in the protocol and to maximally benefit from the interventions. Inversely, it is possible that greater psychosocial stressors served as barriers to both clinical improvement and attendance for some clients. The current results can be interpreted in several ways. Given that the GEL model was not supported (suggesting that clients did not discontinue treatment because they had improved quickly and already met their goals) and the rate of favorable outcomes was highest for those who completed the protocol (even relative to those who discontinued in the last four sessions), it may be that all CPT sessions, including the last four, have added value for most clients. Notably, the first eight sessions of CPT emphasize skill acquisition as clients are introduced to a series of worksheets that build on one another to target cognitive change. At the end of session seven, and for the remainder of the protocol, they begin using a worksheet which incorporates all the skills that were introduced in prior worksheets. The skill mastery that this repetition allows might facilitate additional growth. Additionally, the final sessions of CPT shift to addressing beliefs in the areas of safety, trust, power/control, esteem, and intimacy, and clients are given the additional assignments of engaging in pleasurable activities and giving and receiving compliments. The current results may therefore be interpreted to indicate that some combination of these therapeutic components is instrumental in achieving favorable clinical outcomes, although additional research is needed to confirm this possibility.

However, that conclusion is somewhat predicated on the assumption that clients who discontinued treatment would have continued to improve, and eventually have achieved favorable outcomes, had they persisted. In a recent study (i.e., Sripada, Ready, Ganoczy, Astin, & Rauch, 2019) in which 24% of clients experienced "meaningful change" (defined as 50% or more PCL reduction) in TFT, 10% of the sample (or 42% of responders) achieved late treatment response (occurring after session 8). This is consistent with the finding from the current study that clients, on average, had to attend 10 sessions to get below the PCL cut-off for probable PTSD. In general, then, multiple studies have demonstrated that clients tend to need later sessions to achieve favorable clinical outcomes and those who discontinue treatment, by definition, are missing out on later sessions. Because those who discontinue treatment do differ, in some ways (e.g., current findings that those who do not complete improve at a slower rate), from those who complete it and, therefore, it is possible that this general observation may not apply in every case. Based on these results and those of Sripada et al. (2019), it appears premature to conclude that these clients would not eventually benefit from treatment. Rather, these clients may just improve more slowly and require more than 12 sessions, a clinical option which was empirically supported by Galovski et al. (2012) and thus integrated into the current CPT manual (Resick et al., 2016).

Our findings corroborate previous calls to utilize prediction models to identify those at higher risk of treatment non-completion (Keefe et al., 2018; Lutz et al., 2018). Based on the current results as well as those of previous studies (e.g., Sripada et al., 2019), low levels of early response may be one relevant predictor, thus necessitating the assessment of PTSD symptoms and general functioning at each session. Retention strategies are recommended for individuals at risk of non-completion. These may include, but are not limited to, motivational interviewing, problem-solving potential treatment barriers, strengthening therapeutic alliance, revisiting rationale for treatment, offering more frequent sessions or alternative modes of treatment delivery (e.g., telehealth), addressing the role of avoidance in trauma recovery, and shoring up social support by providing education to loved ones about how to support TFT.

4.2. Strengths, limitations, and future directions

The current study has addressed the call for future studies on non-completion in CPT treatment to "include larger, more diverse sample sizes from a variety of clinical settings and administer brief symptom measures prior to each session," (Szafranski et al., 2017, p. 96). Specifically, the current sample is more varied than that of previous research regarding its gender diversity, representation of active duty, Veteran, and civilian populations, and inclusion of a wide variety of trauma types, which increases the generalizability of the results. CPT was provided in routine care among a variety of clinical settings and thus, it more closely approximates real-world practice, which may be especially important when studying treatment non-completion given that non-completion tends to be higher in real-world practice than RCTs (Najavits, 2015). Finally, the administration of weekly self-report measures at each session allowed for more accurate examination of outcomes by timing of treatment discontinuation.

In addition to these strengths, the current study also has several limitations. First is the way in which treatment non-completion was operationalized. Study therapists were responsible for administering self-report measures to their clients and then turning them in, and the absence of these measures was taken to mean that the session had not occurred. It is possible that there were additional sessions beyond the point at which non-completion was assumed, but that therapists failed to administer and/or turn in the measures. Patterns of available data suggest that this scenario is unlikely, however. Further, there is no consensus in the literature regarding how to define non-completion and there are likely limitations inherent to all operationalizations. Additionally, utilizing a PCL cut-off of 50 may also be a limitation - although that is the threshold for a probable PTSD diagnosis, it may not follow from that that a score below 50 is consistent with a favorable outcome. We decided on this cut-off as it is most frequently used in previous literature (e.g., Andrykowski et al., 1998; Lang et al., 2012; Weathers et al., 1993). To mitigate this limitation, we assessed favorable PTSD outcomes in other ways (RCSI, as well as examining which clients achieved *both* RCSI *and* ending under the cut-off) and assessed outcomes in general mental health functioning.

Another limitation is that therapists in the current study were less experienced in delivering CPT and, therefore, may have been less efficient or less skilled in retaining clients in a TFT. For less experienced therapists, in particular, it is possible that all 12 sessions may be required for clients to achieve favorable outcomes. As previously noted, the current study implemented a version of CPT that required the written account. Given that the timing of written account coincided with when the majority of treatment discontinuation occurred, and that the written account is no longer a required component of the protocol, it is possible that patterns of non-completion would be different if this study were to be replicated without the written trauma account component. Finally, although the current sample demonstrates diversity in many ways (i.e., gender, Veteran status, trauma type) the vast majority of clients were White and no information regarding sexual orientation was collected. Consequently, future research should attempt to replicate the results of the current study with differing levels of experience among CPT providers, with the most updated CPT protocol, and among a more diverse sample of clients. Additionally, it is quite likely that people discontinue treatment for different reasons. Therefore, researchers should also obtain reasons for non-completion, directly from clients, and establish factors that predict who discontinues because they are doing relatively well from those who are not.

4.3. Conclusions

The current results demonstrate that, in contrast with studies that have examined psychotherapy dose-response in broader, more diagnostically diverse treatment samples with less clearly defined treatment protocols (e.g., Baldwin et al., 2009; Barkham et al., 2006; Falkenström et al., 2016; Owen et al., 2016; Reese et al., 2011; Stulz et al., 2013), the GEL model does not apply to symptom improvement among clients engaged in CPT. Instead, those with greater rates of improvement were greater for those who attend more sessions. Relatedly, while a sizeable minority of clients who did not complete CPT treatment achieved favorable clinical outcomes, the average client in this routine treatment setting sample who achieved favorable outcomes completed at least 10 sessions, if not the full protocol. Consequently, identifying clients who may be at risk for discontinuing treatment and making a concerted effort toward retaining them, or matching them to an effective treatment that they are more likely to complete (Keefe et al., 2018), is imperative.

Acknowledgments

This work was supported by the Canadian Institutes for Health Research grant [259353]. Work on this paper by the first author was supported by NIH grant T32 DA019426.

References

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author Text Revision.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Andrykowski, M. A., Cordova, M. J., Studts, J. L., & Miller, T. W. (1998). Posttraumatic stress disorder after treatment for breast cancer: Prevalence of diagnosis and use of the PTSD Checklist—Civilian Version (PCL—C) as a screening instrument. *Journal of Consulting and Clinical Psychology, 66*(3), 586–590. https://doi.org/10.1037/0022-006X.66.3.586.

Asmundson, G. J. G., Thorisdottir, A. S., Roden-Foreman, J. W., Baird, S. O., Witcraft, S. M., Stein, A. T., ... Powers, M. B. (2019). A meta-analytic review of cognitive processing therapy for posttraumatic stress disorder in adults. *Cognitive Behaviour Therapy, 48*, 1–14. https://doi.org/10.1080/16506073.2018.1522371.

Baldwin, S. A., Berkeljon, A., Atkins, D. C., Olsen, J. A., & Nielsen, S. L. (2009). Rates of change in naturalistic psychotherapy: Contrasting dose–effect and good-enough level models of change. *Journal of Consulting and Clinical Psychology, 77*(2), 203–211. https://doi.org/10.1037/a0015235.

Barkham, M., Connell, J., Stiles, W. B., Miles, J. N. V., Margison, F., Evans, C., ... Mellor Clark, J. (2006). Dose-effect relations and responsive regulation of treatment duration: The good enough level. *Journal of Consulting and Clinical Psychology, 74*(1), 160–167. https://doi.org/10.1037/0022-006X.74.1.160.

Bass, J. K., Annan, J., McIvor Murray, S., Kaysen, D., Griffiths, S., Cetinoglu, T., & Bolton, P. A. (2013). Controlled trial of psychotherapy for Congolese survivors of sexual violence. *The New England Journal of Medicine, 368*, 2182–2191. https://doi.org/10.1056/NEJMoa1211853.

Blake, D. D., Weathers, F. W., Nagy, L. N., Kaloupek, D. G., Glauminzer, G., Charney, D. S., ... Keane, T. M. (1990). A clinician rating scale for assessing current and lifetime PTSD: The CAPS-1. *The Behavior Therapist, 18*, 187–188.

Chard, K. M. (2005). An evaluation of cognitive processing therapy for the treatment of posttraumatic stress disorder related to childhood sexual abuse. *Journal of Consulting and Clinical Psychology, 73*, 965–971. https://doi.org/10.1037/0022-006X.73.5.965.

Cogan, C. M., Healy, E. T., Chard, K. M., & Ashton, S. A. (2015). Treatment dropout in the VACPT training program. *Poster presented at the 2015 international society for traumatic stress studies 31st annual meeting*.

Cohen, J. (1988). *Statistical power analysis for the behavioral scientist.* New York, NY: Lawrence Erlbaum Associates.

DeViva, J. C. (2014). Treatment utilization among OEF/OIF Veterans referred for psychotherapy for PTSD. *Psychological Services, 11*, 179–184. https://doi.org/10.1037/a0035077.

Eftekhari, A., Ruzek, J. I., Crowley, J. J., Rosen, C. S., Greenbaum, M. A., & Karlin, B. E. (2013). Effectiveness of national implementation of prolonged exposure therapy in Veterans Affairs care. *Journal of the American Medical Association Psychiatry, 70*, 949–955. https://doi.org/10.1001/jamapsychiatry.2013.36.

Falkenström, F., Josefsson, A., Berggren, T., & Holmqvist, R. (2016). How much therapy is enough? Comparing dose-effect and good-enough models in two different settings. *Psychotherapy, 53*(1), 130–139. https://doi.org/10.1037/pst0000039.

Feingold, A. (2009). Effect sizes for growth-modeling analysis for controlled clinical trials in the same metric as for classical analysis. *Psychological Methods, 14*(1), 43. https://doi.org/10.1037/a0014699.

Forbes, D., Lloyd, D., Nixon, R. D., Elliott, P., Varker, T., Perry, D., ... Creamer, M. (2012). A multisite randomized controlled effectiveness trial of cognitive processing therapy for military-related posttraumatic stress disorder. *Journal of Anxiety Disorders, 26*, 442–452. https://doi.org/10.1016/j.janxdis.2012.01.006.

Galovski, T. E., Blain, L. M., Mott, J. M., Elwood, L., & Houle, T. (2012). Manualized therapy for PTSD: Flexing the structure of cognitive processing therapy. *Journal of Consulting and Clinical Psychology, 80*(6), 968–981. https://doi.org/10.1037/a0030600.

Garcia, H. A., Kelley, L. P., Rentz, T. O., & Lee, S. (2011). Pretreatment predictors of dropout from cognitive behavioral therapy for PTSD in Iraq and Afghanistan war Veterans. *Psychological Services, 8*, 1–11. https://doi.org/10.1037/a0022705.

Gutner, C. A., Gallagher, M. W., Baker, A. S., Sloan, D. M., & Resick, P. A. (2016). Time course of treatment dropout in cognitive–behavioral therapies for posttraumatic stress disorder. *Psychological Trauma: Theory Research Practice and Policy, 8*, 115–121. https://doi.org/10.1037/tra0000062.

Howard, K. I., Kopta, S. M., Krause, M. S., & Orlinsky, D. E. (1986). The dose–effect relationship in psychotherapy. *The American Psychologist, 41*, 159–164. https://doi.org/10.1037/0003-066X.41.2.159.

Imel, Z. E., Laska, K., Jakupcak, M., & Simpson, T. L. (2013). Meta-analysis of dropout in treatments for posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology, 81*(3), 394–404. https://doi.org/10.1037/a0031474.

Jacobson, N. S., Follette, W. C., & Revenstrof, D. (1984). Psychotherapy outcome research: Methods for reporting variability and evaluating clinical significance. *Behavior Therapy, 15*, 336–352.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59*(1), 12–19. https://doi.org/10.1037/0022-006X.59.1.12.

Keefe, J. R., Wiltsey Stirman, S., Cohen, Z. D., DeRubeis, R. J., Smith, B. N., & Resick, P. A. (2018). In rape trauma PTSD, patient characteristics indicate which trauma-focused treatment they are most likely to complete. *Depression and Anxiety, 35*(4), 330–338. https://doi.org/10.1002/da.22731.

Kehle-Forbes, S. M., Meis, L. A., Spoont, M. R., & Polusny, M. A. (2016). Treatment initiation and dropout from prolonged exposure and cognitive processing therapy in a VA outpatient clinic. *Psychological Trauma: Theory Research Practice and Policy, 8*, 107–114. https://doi.org/10.1037/tra0000065.

Kessler, R. C. (2000). Posttraumatic stress disorder: The burden to the individual and to society. *The Journal of Clinical Psychiatry, 61*(suppl 5), 4–12. Retrieved from http://www-psychiatrist-com.laneproxy.stanford.edu/jcp/pages/home.aspx.

Kopta, S. M. (2003). The dose-effect relationship in psychotherapy: A defining achievement for Dr. Kenneth Howard. *Journal of Clinical Psychology, 59*, 727–733. https://doi.org/10.1002/jclp.10167.

Lambert, M. J., Hansen, N. B., & Finch, A. E. (2001). Patient-focused research: Using patient outcome data to enhance treatment effects. *Journal of Consulting and Clinical Psychology, 69*, 159–172. https://doi.org/10.1037/0022-006X.69.2.159.

Lambert, M. J., Hansen, N. B., Umphress, V., Lunnen, K., Okiishi, J., Burlingame, G. M., ... Reisenger, C. W. (1996). *Administration and scoring manual for the OO-45.2.* Stevenson, MD: American Professional Credentialing Services LLC.

Lang, A. J., Wilkins, K., Roy-Byrne, P. P., Golinelli, D., Chavira, D., Sherbourne, C., ... Stein, M. B. (2012). Abbreviated PTSD Checklist (PCL) as a guide to clinical response. *General Hospital Psychiatry, 34*(4), 332–338. https://doi.org/10.1016/j.genhosppsych.2012.02.003.

Lutz, W., Schwartz, B., Hofmann, S. G., Fisher, A. J., Husen, K., & Rubel, J. A. (2018). Using network analysis for the prediction of treatment dropout in patients with mood and anxiety disorders: A methodological proof-of-concept study. *Scientific Reports, 8*(1), 7819.

Meis, L. A., Noorbaloochi, S., Hagel Campbell, E. M., Erbes, C. R., Polusny, M. A., Velasquez, T. L., ... Tuerk, P. W. (2019). Sticking it out in trauma-focused treatment

for PTSD: It takes a village. *Journal of Consulting and Clinical Psychology, 87*(3), 246. https://doi.org/10.1037/ccp0000386.

Monson, C. M., & Fredman, S. J. (2012). *Cognitive-behavioral conjoint therapy for PTSD: Harnessing the healing power of relationships.* New York, NY: Guilford Press.

Monson, C. M., Gradus, J. L., Young-Xu, Y., Schnurr, P. P., Price, J. L., & Schumm, J. A. (2008). Change in posttraumatic stress disorder symptoms: Do clinicians and patients agree? *Psychological Assessment, 20*(2), 131–138. https://doi.org/10.1037/1040-3590.20.2.131.

Monson, C. M., Schnurr, P. P., Resick, P. A., Friedman, M. J., Young-Xu, Y., & Stevens, S. P. (2006). Cognitive processing therapy for Veterans with military-related posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology, 74*, 898–907. https://doi.org/10.1037/0022-006X.74.5.898.

Monson, C. M., Shields, N., Suvak, M. K., Lane, J. E. M., Shnaider, P., Landy, M. S. H., & Stirman, S. W. (2018). A randomized controlled effectiveness trial of training strategies in cognitive processing therapy for posttraumatic stress disorder: Impact on patient outcomes. *Behaviour Research and Therapy, 110*, 31–40. https://doi.org/10.1016/j.brat.2018.08.007.

Mott, J. M., Mondragon, S., Hundt, N. E., Beason-Smith, M., Grady, R. H., & Teng, E. J. (2014). Characteristics of U.S. Veterans who begin and complete prolonged exposure and cognitive processing therapy for PTSD. *Journal of Traumatic Stress, 27*, 265–273. https://doi.org/10.1002/jts.21927.

Najavits, L. M. (2015). The problem of dropout from "gold standard" PTSD therapies. *F1000Prime Reports, 7*, 43. https://doi.org/10.12703/P7-43.

Niles, B. L., Polizzi, C. P., Voelkel, E., Weinstein, E. S., Smidt, K., & Fisher, L. M. (2017). Initiation, dropout, and outcome from evidence-based psychotherapies in a VA PTSD outpatient clinic. *Psychological Services, 15*(4), 496–502. https://doi.org/10.1037/ser0000175.

Owen, J. J., Adelson, J., Budge, S., Kopta, S. M., & Reese, R. J. (2016). Good-enough level and dose-effect models: Variation among outcomes and therapists. *Psychotherapy Research, 26*(1), 22–30. https://doi.org/10.1080/10503307. 2014.966346.

Reese, R. J., Toland, M. D., & Hopkins, N. B. (2011). Replicating and extending the good-enough level model of change: Considering session frequency. *Psychotherapy Research, 21*(5), 608–619. https://doi.org/10.1080/10503307.2011.598580.

Resick, P. A., Galovski, T. E., Uhlmansiek, M. O., Scher, C. D., Clum, G. A., & Young-Xu, Y. (2008). A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interpersonal violence. *Journal of Consulting and Clinical Psychology, 76*, 243–258. https://doi.org/10.1037/0022-006X.76.2.243.

Resick, P. A., Monson, C. M., & Chard, K. M. (2016). *Cognitive processing therapy for PTSD: A comprehensive manual.* New York, NY, US: Guilford Press.

Resick, P. A., Nishith, P., Weaver, T. L., Astin, M. C., & Feuer, C. A. (2002). A comparison of cognitive-processing therapy with prolonged exposure and a waiting condition for the treatment of chronic posttraumatic stress disorder in female rape victims. *Journal of Consulting and Clinical Psychology, 70*, 867–879. https://doi.org/10.1037/0022-006X.70.4.867.

Rutt, B. T., Oehlert, M. E., Krieshok, T. S., & Lichtenberg, J. W. (2018). Effectiveness of cognitive processing therapy and prolonged exposure in the Department of Veterans Affairs. *Psychological Reports, 121*(2), 282–302. https://doi.org/10.1177/0033294117727746.

Sripada, R. K., Ready, D. J., Ganoczy, D., Astin, M. C., & Rauch, S. A. (2019). When to Change the Treatment Plan: An Analysis of Diminishing Returns in VA Patients undergoing PE and CPT. *Behavior Therapy*. https://doi.org/10.1016/j.beth.2019.05.003https://www-sciencedirect-com.ezproxy.uakron.edu:2443/science/article/pii/S0005789419300498?via%3Dihub.

Stirman, S. W., Shields, N., Deloriea, J., Landy, M. S., Belus, J. M., Maslej, M. M., ... Monson, C. M. (2013). A randomized controlled dismantling trial of post-workshop consultation strategies to increase effectiveness and fidelity to an evidence-based psychotherapy for Posttraumatic stress disorder. *Implementation Science, 8*(1), https://doi.org/10.1186/1748-5908-8-82.

Stulz, N., Lutz, W., Kopta, S. M., Minami, T., & Saunders, S. M. (2013). Dose–effect relationship in routine outpatient psychotherapy: Does treatment duration matter? *Journal of Counseling Psychology, 60*(4), 593–600. https://doi.org/10.1037/a0033589.

Surís, A., Link-Malcolm, J., Chard, K., Ahn, C., & North, C. (2013). A randomized clinical trial of cognitive processing therapy for Veterans with PTSD related to military sexual trauma. *Journal of Traumatic Stress, 26*, 28–37.

Szafranski, D. D., Smith, B. N., Gros, D. F., & Resick, P. A. (2017). High rates of PTSD treatment dropout: A possible red herring? *Journal of Anxiety Disorders, 47*, 91–98. https://doi.org/10.1016/j.janxdis.2017.01.002.

Walter, K. H., Dickstein, B. D., Barnes, S. M., & Chard, K. M. (2014). Comparing effectiveness of CPT to CPT-C among US veterans in an interdisciplinary residential PTSD/TBI treatment program. *Journal of Traumatic Stress, 27*(4), 438–445. https://doi.org/10.1002/jts.21934.

Wamser-Nanney, R., Scheeringa, M. S., & Weems, C. F. (2016). Early treatment response in children and adolescents receiving CBT for trauma. *Journal of Pediatric Psychology, 41*, 128–137. https://doi.org/10.1093/jpepsy/jsu096.

Weathers, F. W., Litz, B. T., Herman, J. A., Huska, J. A., & Keane, T. M. (1993). The PTSD checklist (PCL): Reliability, validity and diagnostic utility. *Paper presented at the 9th annual meeting of the international society for traumatic stress studies*.

Zayfert, C., Deviva, J. C., Becker, C. B., Pike, J. L., Gillock, K. L., & Hayes, S. A. (2005). Exposure utilization and completion of cognitive behavioral therapy for PTSD in a "real world" clinical practice. *Journal of Traumatic Stress, 18*, 637–645. https://doi.org/10.1002/jts.20072.