

# Cognitive Processing Therapy for the Treatment of Acute Stress Disorder Following Sexual Assault: A Randomised Effectiveness Study

Reginald D.V. Nixon, Talitha Best, Sarah R. Wilksch, Samantha Angelakis, Lisa J. Beatty and Nathan Weber

*School of Psychology, Flinders University, Adelaide, Australia*

The effectiveness of individually administered cognitive processing therapy (CPT) when compared with treatment as usual (TAU) in a community sexual assault centre was tested. Trauma survivors with acute stress disorder (ASD) following sexual assault were randomised to either CPT ( $n = 25$ ) or TAU ( $n = 22$ ), and assessed at pretreatment, posttreatment, and 3-, 6- and 12-month follow-up. Both groups demonstrated large reductions in PTSD and depression symptoms following treatment, and these gains were maintained over the course of follow-ups (Cohen's  $d$ s for PTSD symptom reductions ranging between 0.76 to 1.45). Although smaller and not always consistent, between-group effect sizes typically favoured CPT. Effect sizes ( $d$ ) ranged between 0.13–0.50 for posttraumatic stress and 0.13–0.41 for depression over the course of follow-ups. Independent assessment of PTSD severity indicated more CPT participants reached good end-state functioning at 12-month follow-up (50%) than TAU (31%). Although both treatments were effective, there were some indications that CPT led to better outcomes relative to therapists delivering their usual therapy. The present study demonstrates that evidence-based, trauma-focused therapy such as CPT can be effective when delivered as an early intervention in a routine mental health setting.

■ **Keywords:** posttraumatic stress disorder, treatment outcome, cognitive processing therapy, effectiveness, sexual assault

A continuum exists between the testing of treatments under traditional, highly controlled circumstances in which it is determined whether the treatment is efficacious (i.e., efficacy trials) and the application of these treatments under more complicated or 'real-world' conditions (effectiveness trials). There continues to be a need to test the effectiveness of trauma-focused treatments delivered in community settings. There is increasing support for treatment of chronic problems such as posttraumatic stress disorder (PTSD) in routine clinical care settings (e.g., Foa et al., 2005; Forbes et al., 2012; Schnurr et al., 2007). However, our knowledge of treating recent stress reactions as seen in acute stress disorder (ASD) in such settings is very limited. This is particularly the case in sexual assault survivors, who experience high levels of acute stress symptoms (Elklit & Christiansen, 2010; Resick 1988; Rothbaum et al., 1992; Steenkamp, Dickstein, Salters-Pedneault, Hofmann, & Litz, 2012).

*Address for correspondence: Reginald D.V. Nixon, Ph.D., School of Psychology, Flinders University, P.O. Box 2100, Adelaide SA 5001, Australia. Email: [reg.nixon@flinders.edu.au](mailto:reg.nixon@flinders.edu.au)*

Trauma-focused therapies are recommended frontline interventions for acute and posttraumatic stress disorder (Australian Centre for Posttraumatic Mental Health [ACPMH], 2013; National Institute for Clinical Excellence [NICE], 2005). Although symptoms can resolve without formal intervention in the weeks following trauma, treatment can be considered when ASD is present and causing distress (ACPMH, 2013). There is a growing evidence base for trauma-focused CBT methods for ASD (see Koucky, Galovski, & Nixon, 2012, for review); however, the bulk of this research has either come out of one treatment centre (that of Richard Bryant and colleagues; however, see also Foa, Hearst-Ikeda, & Perry, 1995; Foa, Zoellner, & Feeny, 2006; Rothbaum et al., 2012). Studies to date have comprised mixed trauma rather than purely sexual assault samples, and generally studies have been conducted in expert treatment centres and/or with clinicians highly proficient in and with strong allegiance to trauma-focused CBT approaches.

Recently, a condensed, six-session version of the highly effective PTSD treatment, cognitive processing therapy (CPT; Resick et al., 2008; Resick, Nishith, Weaver, Astin, & Feuer, 2002), has shown promise for treating ASD in a mixed assault sample (Nixon, 2012). The present article examines the effectiveness of CPT compared with active TAU for survivors of recent sexual assault with ASD. Therapy was delivered by community clinicians working in a sexual assault centre, and clients were assessed at posttreatment as well as 3 months, 6 months, and 12 months following treatment. We did not use a waitlist control group given prior ASD studies have shown active treatment results in greater change than such control groups (Bryant et al., 2008; Foa et al., 1995; Foa et al., 2006), and the service did not allow this design due to ethical concerns of delaying treatment for their clients. We predicted that both interventions would result in sizeable reductions in posttrauma symptom severity and depression but that these changes would be more pronounced in the CPT group.

At this time no *effectiveness* trials of ASD treatment have been conducted in a community mental health setting, let alone for sexual assault survivors with ASD. Our study addresses this limitation. The importance of this work is underscored by prospective studies that have found that in the month after sexual assault, approximately 60–78% of women have clinically significant acute stress symptoms (Elklit & Christiansen, 2010; Resick, 1988; Rothbaum et al., 1992; Steenkamp et al., 2012). In these largely non-treatment seeking samples, between 35–55% had probable PTSD 3–4 months post-assault, underscoring the consequences of this high impact trauma. Unlike other trauma samples where a sizeable number of survivors might show a resilience trajectory following trauma (i.e., mild initial symptoms followed by good recovery or generally low symptoms; e.g., deRoos-Cassini, Mancini, Rusch, & Bonanno, 2010; O'Donnell, Elliot, Lau, & Creamer, 2007), sexual assault is associated with high levels of symptoms that persist for a significant number of individuals. More recently, Steenkamp et al. (2012) observed that only 30% of their sample could be characterised as fitting into a group considered to have demonstrated substantial recovery by 4 months posttrauma. There is therefore a need to continue to test interventions for recent sexual assault survivors who present to community mental health.

Despite trauma-focused therapies being recommended frontline interventions, there is also evidence historically that trauma-focused intervention was not used as widely as hoped (Becker, Zayfert, & Anderson, 2004; Russell & Silver, 2007). However, a number of dissemination and effectiveness trials have demonstrated that interventions with a trauma focus — in particular, cognitive-behavioural therapy

(CPT) interventions for PTSD — can be successfully used in routine clinical care settings (e.g., Foa et al., 2005; Forbes et al., 2012; Schnurr et al., 2007).

Although there is a growing number of efficacy studies supporting the use of CBT for ASD<sup>1</sup> and evidence that associated comorbidity also reduces, such as depressive symptoms (see Koucky et al., 2012, for review), the bulk of this evidence has come from one research laboratory (Bryant, Harvey, Dang, Sackville, & Basten, 1998; Bryant et al., 2008; Bryant, Moulds, Guthrie, & Nixon, 2003, 2005; Bryant, Sackville, Dang, Moulds, & Guthrie, 1999, although see also Rothbaum et al., 2012), where the samples typically comprise both motor vehicle accident and non-sexual assault survivors. The lack of research with other populations remains a limitation given a recent meta-analysis suggests that of the early intervention studies to date, larger effect sizes are associated with traffic-accident survivors relative to other trauma types (Kliem & Kröger, 2013). Two acute PTSD/ASD studies have included sexual assault and non-sexual assault participants (Foa et al., 1995; Foa et al., 2006). These studies observed that at posttreatment, CBT seemed to hasten recovery relative to waitlist (in a non-randomised design; Foa et al., 1995) and relative to supportive counselling (Foa et al., 2006). Foa et al. (2006) observed that by 9-month follow-up, few differences were observed between CBT, supportive counselling, and an assessment control condition. However, these findings may also be explained by reduced homework requirements in CBT and the therapeutic effects of the assessment control condition (see Foa et al., 2006, and Nixon, 2012, for further discussion). At this time there is support for the efficacy of CBT with a trauma-focus for ASD, although the majority of this evidence comes from non-sexual assault samples.

There are two significant gaps in our current knowledge of the optimal methods to treat acute stress relevant to the present study. First, the effectiveness of treatment for ASD in routine community mental health settings is largely unknown, especially for recent sexual assault survivors. To date, the majority of multi-session treatment studies have been conducted in university or research centres and/or with clinicians highly proficient in and with strong allegiance to trauma-focused CBT approaches. Second, consistent with research in relation to clinicians' attitudes to treating post-traumatic stress in general (Becker et al., 2004), it is our experience that the proposal of delivering CBT to recent sexual assault survivors can sometimes be met with resistance by clinicians who may have concerns regarding re-traumatisation of clients and exacerbation of symptoms, and in the context of manualised therapies, may see such approaches as interfering with establishing therapeutic alliance. It is important to note these fears are unfounded with no reports of serious adverse events (e.g., self-harm) in ASD trials (e.g., Bryant et al., 2008; Foa et al., 2006), and PTSD studies indicate working alliance is not compromised in manualised approaches relative to unstructured therapy (e.g., Forbes et al., 2012).

The primary goals of the present study were several fold: (1) to further evaluate the efficacy of an abbreviated format of a trauma-focused CBT approach, cognitive processing therapy (CPT), that has showed promise in an initial trial (Nixon, 2012); (2) to examine its efficacy in a wholly sexual assault sample; and (3) to examine whether CPT can be used effectively within a community sexual assault centre where therapy was delivered by non-CBT oriented, non-selected therapists to routine clients.

CPT is typically a 12-session approach, originally designed for the treatment of *chronic* PTSD following sexual assault. It has demonstrated efficacy in a number of randomised trials with interpersonal and combat trauma samples and also significantly reduces depression symptoms (Chard, 2005; Monson et al., 2006; Resick & Schnicke,

1992; Resick et al., 2008; Resick et al., 2002). More recently, an effectiveness trial conducted with a veteran sample in routine care found it to be superior to TAU (Forbes et al., 2012). Treatment of ASD typically involves 4–6 sessions of CBT (e.g., Foa et al., 1995; Foa et al., 2006; Bryant, Moulds, Guthrie, & Nixon, 2003, 2005; Bryant et al., 2008), and the treatment manuals of Bryant and colleagues use materials from the CPT manual. In a pilot study, an abbreviated format of CPT (six sessions) has been shown to be well tolerated by clients exposed to recent trauma and resulted in large reductions in PTSD symptoms when used with (predominantly) non-sexual assault victims (Nixon, 2012). Whether these positive outcomes can be replicated in routine clinical care with recent trauma victims is unknown. Interestingly, the call to use evidence-based treatments in routine clinical care has been questioned. Arguments have been made that the evidence for the superiority of evidence-based treatments is confounded by comparison with ‘treatment as usual’ that has in fact included only minimal therapeutic contact or where TAU therapists were proscribed from employing certain techniques (Benish, Imel, & Wampold, 2008; for debates, see Ehlers et al., 2010, and Wampold et al., 2010). There is a need for clear documentation that comparison therapies constitute real and active therapy (e.g., in Forbes et al., 2012, TAU was not recorded thus could not be checked the same way that CPT was).

In summary, the present article examines the effectiveness of CPT compared with active TAU for survivors of recent sexual assault with ASD. Therapy was delivered by community clinicians working in a sexual assault centre, and clients were assessed at posttreatment as well as 3 months, 6 months, and 12 months following treatment. We predicted that both interventions would result in sizeable reductions in posttrauma symptom severity and depression but that these changes would be more pronounced in the CPT group.

## Method<sup>2</sup>

### *Participants*

Consecutive clients seeking treatment at the Yarrow Place Rape and Sexual Assault Crisis Centre in Adelaide between June 2008 and April 2011 were considered for the study. Demographic and relevant background is summarised in Table 1. Inclusion criteria consisted of clients being 18 years or older who had experienced rape or sexual assault in the past month and were able to attend face-to-face counselling. Clients had to meet criteria for ASD, and for those taking psychotropic medication this had to be stable for the 4-week period prior to beginning therapy. Clients with uncontrolled psychosis, current substance dependence requiring immediate attention, insufficient English, significant cognitive impairment or disability, significant suicide risk, or ongoing traumatisation (e.g., being stalked) were excluded. Clinical judgment was used to determine whether clients met exclusion criteria, and typically these clients were referred on to further specialist services. All participants provided written informed consent approved by the relevant hospital ethics committee.

A total of 158 clients were considered for the study (see Figure 1 for full details of exclusion). The most common reason for exclusion was intellectual/cognitive disability ( $n = 24$ ), suicide risk ( $n = 21$ ), and a number of otherwise eligible participants could not make themselves available to be assessed within 4 weeks of their trauma ( $n = 22$ ). Of those eligible for the study, 82% ( $n = 47$ ) agreed to participate in the research trial, suggesting that clinical and research exclusion criteria aside, the sample

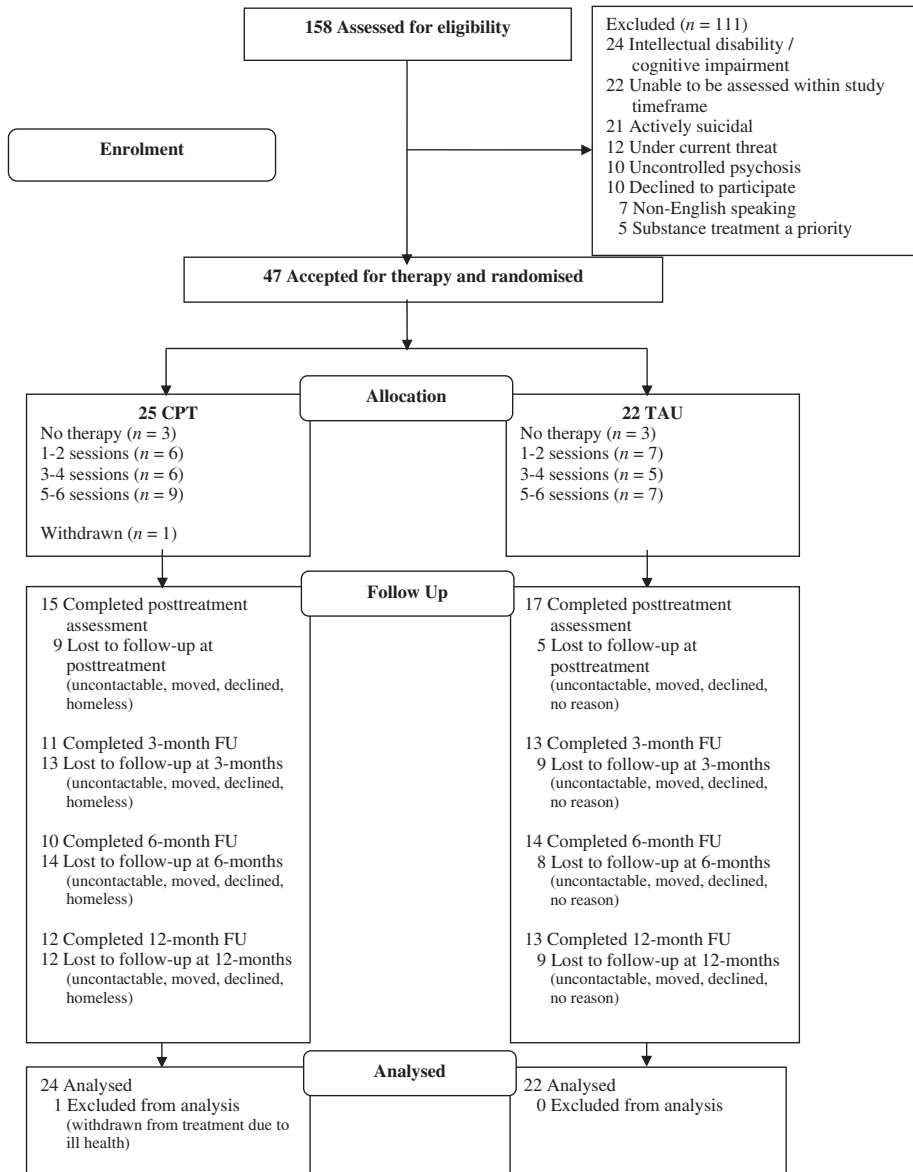
**TABLE 1**

## Participant Baseline Characteristics

Variable	CPT ( <i>n</i> = 24)		TAU ( <i>n</i> = 22)		<i>d</i> or $\varphi$	Statistic
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Age (years)	32.46	11.43	29.95	8.48	0.25	$t(44) = 0.84$
Gender	23F, 1M		22F		0.14	FET = 1.00
Caucasian ethnicity	20 (83%)		20 (91%)		0.11	FET = 0.67
Education (years)	13.48	2.87	13.91	2.74	0.15	$t(43) = 0.61$
Income (net annual, \$AUS)					0.24	$\chi^2(3, N = 45) = 2.67$
<\$10K	6 (26%)		4 (18%)			
\$10-\$30K	8 (35%)		10 (45%)			
\$30-\$50K	4 (17%)		6 (27%)			
>\$50K	5 (22%)		2 (9%)			
Comorbidity						
Mood	12 (52%)		16 (73%)		0.21	FET = 0.22
Anxiety	10 (44%)		14 (64%)		0.20	FET = 0.24
Substance	6 (26%)		7 (32%)		0.06	FET = 0.75
Psychotropic medication	8 (35%)		10 (46%)		0.11	FET = 0.55
Relationship to perpetrator					0.20	$\chi^2(2, N = 46) = 1.76$
Stranger	10 (42%)		11 (50%)			
Acquaintance or friend	10 (42%)		10 (45%)			
Ex-intimate or relative	4 (16%)		1 (5%)			
Previous trauma	22 (100%)		20 (91%)		0.22	FET = 0.49
Sexual	17 (77%)		17 (77%)		0.00	FET = 1.00
Physical	13 (59%)		12 (55%)		0.05	FET = 1.00
Other	22 (100%)		19 (86%)		0.27	FET = 1.00
Prior psychiatric hospitalisation	7 (30%)		6 (27%)		0.04	FET = 1.00

Note: Some *dfs* vary due to missing data and percentages are rounded. CPT = Cognitive processing therapy; TAU = Treatment as usual; FET = Fisher's Exact Test.

entered into the study was fairly representative of the service's client group. Of the 47 participants randomised to treatment, 25 were allocated to CPT and 22 to TAU (allocation to group was broken after randomisation on two occasions due to therapist unavailability in the TAU condition, hence unequal numbers<sup>3</sup>). One participant was withdrawn from the CPT due to a life-threatening illness requiring immediate treatment, leaving 24 in that group. Cessation of funding precluded the reaching of the original target sample size, resulting in lower power being achieved (discussed further

**FIGURE 1**

Flow of participant progress throughout the trial.

CPT = cognitive processing therapy; TAU = treatment as usual; FU = follow-up.

in Statistical Methods). As can be seen in Table 1, the sample was complex in relation to comorbidity (86% had at least one other comorbid diagnosis), trauma history (e.g., 77% had previous sexual victimisation), and levels of past psychiatric hospitalisation (approximately 30% of the sample).

#### Behaviour Change

## Procedures

**Design.** A randomised, repeated measures design was adopted with posttreatment assessments conducted 1 week following the completion of the CPT protocol and equivalent time period for TAU. Follow-up assessments took place at 3-, 6-, and 12-month follow-up. Participants were screened for suitability on contacting the service (either by phone or face to face). Those meeting basic inclusion criteria (e.g., sexual assault within past 4 weeks) undertook a clinical assessment following informed written consent. Following confirmation of eligibility, participants were sequentially randomised (1:1 ratio) to treatment by the project director. The project director generated the randomisation and allocated participants to groups. Participants were aware of the condition they were allocated to. Assessors did not provide therapy and were unaware at posttreatment and follow-up of treatment condition or degree of treatment received. Assessors did not report any failure of masking procedures. Participants received \$50 for each posttreatment and follow-up interview.

**Measures.** ASD and PTSD diagnosis and symptom severity were the primary measures and assessed with the Clinician-Administered PTSD scale (CAPS; Blake et al., 1995). The CAPS is a structured clinical interview that assesses the 17 symptoms of PTSD described in the *DSM-IV* PTSD criteria, and has additional symptom questions that can be used to derive ASD diagnosis. The 1(intensity)/2(frequency) rule for symptom presence was adopted (Weathers, Ruscio, & Keane, 1999). The intensity and frequency of each symptom can be rated on a 5-point scale and summed, resulting in an overall severity score. ASD criteria consists of 19 symptoms, but PTSD only 17 symptoms. Thus, we report CAPS severity scores and diagnosis for PTSD to be able to meaningfully compare outcomes across all assessments<sup>4</sup> (and were indexed to the recent trauma for which the client presented for treatment). Interrater reliability of diagnosis on a random sample of interviews ( $n = 20$ ) was high ( $\chi = 1.00$ ;  $r$  [total severity score] = .80). Established measures were used to index self-reported PTSD symptoms and unhelpful trauma-related beliefs; the Posttraumatic Stress Disorder Checklist (PCL-S; Weathers, Litz, Herman, Huska, & Keane, 1993), and the Posttraumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999).

Secondary measures were current comorbid mood, other anxiety and substance use disorders and were assessed by the MINI International Neuropsychiatric Interview (MINI; Sheehan, Lecrubier et al., 1997). Interrater reliability for any current diagnosis (15 interviews) was high ( $\chi = 1.00$ ), with percentage agreement good for each category (mood: 100%,  $\chi = 1.00$ ; anxiety: 87%,  $\chi = 0.71$ ; substance: 87%,  $\chi = 0.58$ ). The Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996) was also completed by participants. A structured clinical interview was used to document relevant information such as demographics, trauma history, medication usage, and so forth. In Session 1, clients completed the Credibility and Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000) to assess expectations regarding treatment success. Therapeutic relationship was assessed with the Working Alliance Inventory short form (WAI-S; Tracey & Kakotovic, 1989). Clients and therapists completed the WAI at Sessions 2, 4, and 6.

**Therapists and training.** Nine female therapists who were regular staff members of Yarrow Place conducted therapy and were randomised to either CPT or TAU, with both groups being comparable in years of clinical experience working with sexual

assault victims (CPT:  $M = 10.63$ ,  $SD = 7.04$ ; TAU:  $M = 12.38$ ,  $SD = 5.15$ ). All staff had a Bachelor of Social Work qualification, and two staff (one in each treatment condition) had Masters qualifications. None identified their therapeutic orientation as being specifically cognitive-behavioural. Therapists allocated to CPT received a 3-day workshop from R.D.V.N., followed by weekly group consultation of 1 hr initially, then approximately 30 min in the latter stages of the trial. TAU therapists received a briefing regarding the trial but no study-specific training or consultation.

**Treatment conditions.** CPT is normally delivered over 12 sessions (see Resick, Monson, & Chard, 2007); however, a modified and abbreviated 6-session format that has previously been trialled (Nixon, 2012) was used. This 6-session manualised format adopted the framework and materials of the CPT manual (Resick et al., 2007) and sessions (90-min duration) were scheduled weekly (the 90-min sessions ensured adequate coverage of CPT content, thus no components were omitted). Initial sessions introduced cognitive restructuring techniques, with later sessions introducing more advanced worksheets and with clients being introduced to alternative ways of thinking. The task of writing an account of the traumatic event for homework was done in Session 2. The processing of this event continued throughout treatment.

TAU encompassed a range of methods including psycho-education, supportive counselling, problem solving, interpersonal therapy, elements of mindfulness, acceptance and value-based techniques, and discussion of thoughts and feelings. Although on occasions elements of cognitive-behavioural techniques were apparent (e.g., discussion of in-vivo exposure to a feared situation such as going to a bar), this was not part of a systematic plan of graded exposure. Unhelpful beliefs were not specifically challenged in a structured fashion or through Socratic dialogue. On occasions, homework exercises were set (e.g., a values-oriented based exercise), but this was not routine. TAU sessions were scheduled according to the normal service delivery model and, as reported in the Results, TAU received a similar number of sessions as CPT in the active treatment phase of the trial, but over the course of the study TAU received more therapy.

**Treatment fidelity.** Therapy was audiotaped in both conditions. As detailed in the Supplementary Materials, CPT therapists' adherence to essential CPT components and their competency was good. CPT and TAU therapists were rated on important therapeutic factors (i.e., genuineness, warmth, accurate empathy, professional manner) using the same scale. Mean ratings fell in the *very good* to *excellent* range, and effect sizes tended to favour CPT ( $d$ s ranging from 0 to 0.64).

### Statistical Approach

Analyses were conducted with the intent-to-treat sample (ITT). These analyses reflected the context of the trial, an effectiveness versus efficacy study, and the fact that individuals vary in relation to the amount of treatment needed. For example, although originally designed as a 12-session protocol, not all PTSD clients need exactly 12 CPT sessions to reach good outcomes (Galovski, Blain, Mott, Elwood, & Houle, 2012).<sup>5</sup> Full details on our statistical approach and justification are given in the Supplementary Materials. Given substantial attrition across posttreatment and follow-up assessments (50%, on average), multiple imputation was adopted for missing data using fully conditional specification, otherwise known as multivariate imputation by chained equations (MICE; van Buuren & Groothuis-Oudshoorn, 2011; computed in



R, a statistical computing environment; R Development Core Team, 2011). Simulations indicate that even with small samples and substantial missing data (e.g., sample  $N = 50$ , 80% missing data), multiple imputation such as MICE demonstrates good performance for addressing missing data (Schafer & Graham, 2002). The imputation model included all baseline symptom measures, treatment group, and outcomes (42 variables in total) to predict missing data. Typically, 15–25 predictor variables are usually sufficient to adequately account for missing data (van Buuren & Groothuis-Oudshoorn, 2011); however, we used all the variables of interest to ensure adequate coverage. Relations between and within time were preserved and imputation values were constrained to the range of observed values in non-missing data.

In terms of sample size, previous intervention studies of ASD have observed large effects between trauma-focused CBT programs and supportive counselling conditions (e.g., Bryant et al., 1998; Bryant et al., 2003). An a priori power analysis indicated that a total sample of 60 would result in the ability to detect a moderate-to-large directional effect between treatment conditions ( $d = 0.65$ , power = .80, using G\*Power 3.1.7; Faul, Erdfelder, Buchner, & Lang, 2009). Accordingly, this was the targeted sample size.

Because we were unable to reach the planned sample size, we adopted an analysis and interpretative approach that focused on effect sizes and the confidence intervals around these effects (see Cumming, 2008, 2014; Faulkner, Fidler, & Cumming, 2008, for detailed discussion of the superiority of effect sizes and confidence intervals vs. planned null hypothesis significance testing). For consistency with earlier research, we also report relevant inferential statistics. We analysed continuous measures (CAPS severity scores, PCL, BDI-II, PTCI) in a series of  $2 \times 2$  mixed ANOVAs to generate required effect sizes and confidence intervals, and pooled the results across imputed data sets using Raghunathan and Dong's (2013) formulae.

Categorical outcomes (PTSD status, response to treatment, good end-state function) were analysed by fitting a generalised linear model with binomial distribution and logit link function (i.e., a logistic regression) and pooled using MICE. Response to treatment was defined by a change of more than 12 points on the CAPS and total score below 45, with good end-state functioning (i.e., remission) defined by a total CAPS score below 20 (Monson et al., 2006; Schnurr et al., 2007). Numbers needed to treat (NNT) were calculated from good end-state functioning percentages. To reiterate, while inferential statistics (including  $p$  values) are reported, interpretations were based on magnitude of effects and their confidence intervals.

## Results

In relation to preliminary analyses, there were generally clinically negligible differences between groups on relevant baseline variables, and between those who did and did not participate in follow-ups. Participants in both groups attended the same number of sessions in the pre- to posttreatment phase (3.5 sessions on average); however, TAU participants continued to have significantly more sessions between posttreatment and 12-month follow-up (with these clients having 4–5 additional sessions on average in each follow-up period). Treatment credibility and working alliance was comparable between groups (see Supplementary Materials for full details).

We conducted repeated measures ANOVAs on imputed data to examine changes on the primary measures of PTSD symptom severity and unhelpful beliefs (CAPS, PCL, PTCI), as well as the secondary outcome of interest, depression (BDI-II).

Imputed descriptive statistics are presented in Table 2, pooled effect sizes in Table 3, and pooled inferential statistics are available in the Supplementary Materials (Table S1). In terms of PTSD, as expected, treatment resulted in large and clinically meaningful reductions for both groups at each follow-up relative to pretreatment. Examination of effect sizes showed these reductions ranged between 1.01 to 1.45 (CAPS), and 0.76 to 1.25 (PCL). Similarly moderate-to-large changes were seen for unhelpful cognitions (PTCI,  $d$  ranging from 0.42 to 0.94). Depression symptoms also reduced for both groups, with large effects seen across all follow-ups ( $d$ s between 0.42 and 0.92). It should be noted that a likely result of modest sample size and variability in scores resulted in rather large confidence intervals.

In terms of between-group differences, we did not obtain clear evidence that the groups differed meaningfully due to the large confidence intervals observed. That said, and although there was some variability in the magnitude of effects between CPT and TAU, overall there was a reasonably consistent pattern of effects favouring CPT (see Table 3). Summarising these results, there was a small-to-moderate difference on the CAPS at pretreatment between the two groups ( $d = 0.39$ ), with this difference remaining stable over the course of follow-ups (ranging between 0.31 – 0.50), indicating this baseline difference was maintained throughout. Self-reported PTSD (PCL) differences between groups that were negligibly different at pretreatment fluctuated across the follow-ups, slightly favouring CPT, but with effects being small in general ( $d$ s between 0.13 and 0.32). Clients' unhelpful cognitions (PTCI) also showed fluctuation, with minimal difference between CPT and TAU seen at two assessments (3-month follow-up,  $d = 0.06$ ; 6-month follow-up,  $d = 0.03$ ), and moderate-sized differences in CPT's favour at posttreatment ( $d = 0.36$ ) and 1-year follow-up ( $d = 0.66$ ). In relation to depression, the degree of difference between the two groups, again favouring CPT, increased over the year after treatment (e.g., posttreatment,  $d = 0.13$ ; 1-year follow-up,  $d = 0.41$ ).

There were no significant adverse events in either condition. Based on available (non-imputed) data, and using a change of more than 12 points on the CAPS as an indicator of reliable change (Monson et al., 2006), two participants in CPT demonstrated worsening of symptoms at different periods. One participant was worse at posttreatment and 3-month follow-up (relative to her pretreatment score), and another participant at 12-month follow-up. Two TAU participants had an increase of exactly 12 points on the CAPS at 6-month follow-up. Interestingly, for these four participants, worsening of symptoms was not seen on their PCL scores.

In terms of diagnostic outcomes, the pooled results demonstrated increasingly smaller differences between the groups in PTSD diagnostic status across follow-ups. At posttreatment, 36% and 57% of the CPT and TAU groups were diagnosed with PTSD (CAPS), odds ratio (OR) = 0.41, 95% CI [0.07, 2.32],  $p = .29$ . At the 3-month follow-up, 49% (CPT) and 58% (TAU) had PTSD, OR = 0.69, 95% CI [0.09, 5.21],  $p = .70$ . By the 6- and 12- month follow-ups, these differences were negligible (6 months: 50% CPT, 46% TAU, OR = 1.20, 95% CI [0.15, 9.27],  $p = .85$ ; 12 months: 51% CPT, 46% TAU, OR = 1.24, 95% CI [0.21, 7.33],  $p = .80$ ).

The proportion of participants showing a response to treatment (i.e., a change of more than 12 points on the CAPS resulting in a total score below 45) was similar. There was little difference between the groups at posttreatment, with 73% and 69% of the CPT and TAU groups showing response (OR = 0.86, 95% CI [0.14, 5.17],  $p = .86$ ). Remaining follow-ups showed a similar pattern, with a slightly larger difference at 3-months' follow-up: at 3 months, 55% of CPT versus 36% of TAU participants

**TABLE 2**CPT and TAU Imputed Means, Standard Deviations Over Time on All Measures ( $N = 46$ )

Measure	Group	Pretreatment		Posttreatment		3-month follow-up		6-month follow-up		1-year follow-up	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
CAPS	CPT	70.52	25.51	36.50	31.81	40.86	29.65	35.71	28.06	31.19	29.00
	TAU	79.77	21.21	45.72	27.67	52.94	28.45	51.34	34.03	42.59	30.32
PCL	CPT	58.23	16.08	39.40	19.65	41.44	19.70	40.80	18.42	36.61	18.73
	TAU	56.75	13.35	44.96	17.48	44.17	17.23	43.38	21.06	42.50	18.73
PTCI	CPT	136.76	40.34	100.32	54.51	111.99	52.33	117.22	54.52	93.26	51.41
	TAU	141.95	35.25	118.14	44.55	114.86	50.04	118.40	49.41	125.79	48.54
BDI-II	CPT	30.48	12.83	18.27	16.46	19.88	15.54	17.74	14.80	17.46	17.45
	TAU	30.32	12.60	20.02	12.68	23.64	14.99	24.34	15.80	23.63	14.72

Note: CPT = cognitive processing therapy ( $n = 24$ ); TAU = treatment as usual ( $n = 22$ ); CAPS = Clinician-Administered PTSD scale; PCL = Posttraumatic Stress Disorder Check List; PTCI = Posttraumatic Cognitions Inventory; BDI-II = Beck Depression Inventory – 2nd Edition.

**TABLE 3**

Within- and Between-Group Pooled Effect Sizes (Cohen's *d* and 95% Confidence Intervals) From Pre- to 1-Year Follow-Up on All Symptom Measures (*N* = 46)

		Within-group <i>d</i> from pretreatment to each follow-up			
Time	Group	CAPS	PCL	PTCI	BDI-II
Post	CPT	1.19 [0.56, 1.80]	1.05 [0.44, 1.65]	0.76 [0.17, 1.35]	0.84 [0.25, 1.43]
	TAU	1.39 [0.72, 2.05]	0.76 [0.14, 1.37]	0.59 [−0.02, 1.19]	0.82 [0.20, 1.43]
3mth	CPT	1.07 [0.46, 1.67]	0.95 [0.35, 1.54]	0.53 [−0.05, 1.10]	0.75 [0.16, 1.33]
	TAU	1.07 [0.43, 1.70]	0.82 [0.20, 1.43]	0.62 [0.02, 1.23]	0.48 [−0.12, 1.08]
6mth	CPT	1.31 [0.68, 1.93]	1.01 [0.40, 1.61]	0.42 [−0.16, 0.99]	0.92 [0.32, 1.52]
	TAU	1.01 [0.38, 1.64]	0.76 [0.14, 1.37]	0.54 [−0.06, 1.14]	0.42 [−0.18, 1.01]
1-yr	CPT	1.45 [0.81, 2.09]	1.25 [0.63, 1.87]	0.94 [0.34, 1.54]	0.86 [0.26, 1.45]
	TAU	1.43 [0.76, 2.09]	0.88 [0.25, 1.49]	0.37 [−0.23, 0.97]	0.49 [−0.12, 1.09]
		Between-group <i>d</i> at each assessment <sup>a</sup>			
Pre		0.39 [−0.19, 0.98]	−0.10 [−0.68, 0.48]	0.14 [−0.44, 0.72]	−0.01 [−0.59, 0.57]
Post		0.31 [−0.27, 0.89]	0.30 [−0.29, 0.88]	0.36 [−0.23, 0.94]	0.13 [−0.45, 0.71]
3mth		0.42 [−0.17, 1.00]	0.16 [−0.42, 0.74]	0.06 [−0.52, 0.63]	0.25 [−0.33, 0.83]
6mth		0.50 [−0.09, 1.08]	0.13 [−0.45, 0.71]	0.03 [−0.55, 0.60]	0.43 [−0.15, 1.02]
1-yr		0.39 [−0.19, 0.98]	0.32 [−0.26, 0.90]	0.66 [0.06, 1.25]	0.41 [−0.18, 0.99]

Note: CPT = cognitive processing therapy (*n* = 24); TAU = treatment as usual (*n* = 22); CAPS = Clinician-Administered PTSD scale; PCL = Posttraumatic Stress Disorder Check List; PTCI = Posttraumatic Cognitions Inventory; BDI-II = Beck Depression Inventory – 2nd Edition.

<sup>a</sup>Positive values reflect CPT scores are lower than TAU scores.

showed a response, OR = 2.19, 95% CI [0.89, 14.75], *p* = .39; at 6 months, 50% CPT versus 51% TAU, OR = 1.05 (95% CI [0.18, 6.11], *p* = .95; and at 12 months, 60% CPT versus 50% TAU, OR = 1.52 (95% CI [0.23, 9.94], *p* = .64.

In terms of good end-state functioning, effects in the small–moderate range favoured CPT. Thus, at posttreatment, 45% of CPT participants versus 31% of TAU met good end-state criteria (OR = 1.82, 95% CI [0.30, 10.96], *p* = .49), and at the 3-month follow-up, 33% CPT versus 12% of TAU participants.<sup>6</sup> At 6 months, this difference was less pronounced (35% CPT, 27% TAU, OR = 1.50, 95% CI [0.26, 8.48], *p* = .63), but became slightly larger by the 12-month follow-up, with 50% of CPT participants meeting good end-state functioning versus 31% of TAU, OR = 2.30, 95% CI [0.41, 12.97], *p* = .32.

In terms of numbers needed to treat (NNT) to reach good end-state functioning, these ranged from 3.08 to 11.65, depending on the time of assessment. NNT was 6.73 on average, indicating that the added benefit of using CPT relative TAU (in terms of an additional participant meeting good end-state functioning) would be seen for every seven individuals treated with CPT.

**Additional analyses.** A large number of potential predictors of posttreatment and 12-month outcome were available. As detailed in the Supplementary Materials, after controlling for group and pretreatment severity, no demographic or trauma characteristic variables accounted for PTSD outcomes.

#### Behaviour Change

## Discussion

This study represents the first test of the effectiveness of an abbreviated CPT protocol for ASD following recent sexual assault. As expected, both interventions resulted in large reductions of PTSD and depressive symptoms, although these effect sizes were somewhat smaller than those observed in prior ASD trials that have used both CBT and supportive counselling therapies (e.g., Bryant et al., 1998; Bryant et al., 2003; Bryant et al., 1999). The smaller effect sizes may be a function of differences in samples (sexual assault versus non-sexual assault and road traffic trauma) or CBT expertise (novice CPT therapists versus experienced CBT clinicians). The current effects are larger than the within-group differences reported in a recent meta-analysis of early CBT interventions for trauma, with those effects generally in the small to moderate range (Kliem & Kröger, 2013).

Of particular interest in the present study was the degree of difference, if any, in outcome between CPT and TAU. Due to the modest sample size and large confidence intervals, we are not in a position to categorically conclude the groups meaningfully differ. It is worth noting, however, that the pattern of effect sizes seemed to favour CPT over TAU. Thus, at each assessment point, more CPT than TAU participants reached good end-state functioning. Between-group effect sizes for PTSD and depression symptom severity also favoured CPT, although the magnitude of difference was in the small-to-medium range across follow-ups. Of the 12 comparisons across measures and follow-ups (excluding the CAPS, where there seemed to be a baseline difference), CPT effects were always larger than TAU. Although the confidence intervals were large, if there was no meaningful difference between CPT and TAU, we would expect that by chance a number of mean values of these effect sizes would have favoured TAU. This was not the case.

It is important to place the current findings in context. First, the current study was comprised wholly of sexual assault victims. Relative to other traumas, sexual assault is associated with the highest risk of posttraumatic psychopathology, especially in the first 3 months following assault (Resick, 1998; Rothbaum et al., 1992); thus, it is arguably more difficult to treat and may require more sessions than those offered in the current study. Second, the current sample reflected the complexity of clients seen in sexual assault centres. Almost 80% had previous sexual victimisation experiences, 96% had experienced other trauma, 86% had at least one comorbid disorder, and approximately 30% had required psychiatric hospitalisation in their lifetime. Third, it is likely that TAU in the present study was different from supportive counselling approaches used in previous ASD trials. TAU therapists were not restricted in how they delivered therapy or the content of this therapy. They had an extremely strong allegiance to their therapeutic approach, and due to the fidelity approach of the study (both TAU and CPT sessions were recorded), TAU therapists appeared quite motivated to deliver therapy as well as possible. Given the issues raised about the credibility of comparator treatments in evidence-based treatment trials (e.g., Benish et al., 2008), it is clear that TAU was a bona fide therapy in the present study, and that client treatment credibility and expectancy ratings slightly favoured TAU over CPT.

Despite the above factors relating to the TAU intervention, CPT typically resulted in better outcomes, especially by 12-month follow-up. Indeed, this finding is the more impressive given that CPT therapists had to learn a therapeutic approach that had many elements quite different from their normal therapeutic model. The CPT therapists were non-CBT clinicians, working from a feminist model of sexual assault

that was very client-centred. Actively tackling avoidance issues in therapy, assertive follow-up with clients who failed to attend a session, detailed discussion of the trauma and the challenging of trauma-related beliefs, all key components of CPT, were not the usual therapeutic methods of these therapists. In spite of this difference, it was useful to note that working alliance remained good in CPT and is consistent with previous studies of PTSD using trauma-focused therapies (e.g., Forbes et al., 2012; Gilboa-Schechtman et al., 2010). It should be remembered that approximately 40% of the TAU participants received ongoing sessions from their therapists over the course of the trial compared with one CPT participant who received a single session after posttreatment, yet CPT clients seemed to be doing better by the final follow-up. To date, only a handful of acute stress studies have examined outcome later than 6 months posttreatment (e.g., Bryant et al., 2003, 2006; Foa et al., 2006). The finding that gains appeared to be maintained at 12-month follow-up is therefore worth highlighting.

The present study is the first to demonstrate that CPT can be effectively delivered to *recent* trauma victims in a routine clinical setting, adding to a growing body of PTSD effectiveness studies that have similarly illustrated this point (e.g., Foa et al., 2005; Forbes et al., 2012; Schnurr et al., 2007). The dissemination and sustainable practice projects that are rolling out CPT and prolonged exposure (PE) throughout the Veterans Affairs in the USA (Chard, Ricksecker, Healy, Karlin, & Resick, 2012; Cook, Dinnen, Thompson, Simiola, & Schnurr, 2014) are also evidence that these treatments can be adopted to good effect outside of clinical trial environments.

In terms of other observations, we note that ASD treatments are typically 5–6 sessions' duration (which informed the current study design). Given the complexity of the sample in terms of victimisation history, comorbidity, and prior psychiatric hospitalisation, our sense is that future clinical and research work would benefit from a flexible session approach, and that more than 6 CPT sessions might be necessary for some clients. Following the pre-post treatment period, approximately 40% of TAU clients received further sessions from the service (vs. one CPT client), yet this did not result in superior TAU outcomes. CPT was arguably a more efficient approach in this regard.

The study had a number of strengths; however, several limitations are acknowledged. The modest sample size and precision of confidence intervals has been discussed but remains a limitation. For service and ethical reasons, a waitlist control group was not included. It is therefore possible that neither intervention was superior to natural recovery. We do not think this explanation likely. First, Foa et al. (2006) demonstrated that CBT was associated with faster recovery following assault and non-sexual assault than natural recovery. Second, in a prospective study of adjustment following sexual assault, and utilising the same self-report measure as in the present study (PCL), Steenkamp et al. (2012) showed that the average initial symptom level for those who indeed made a good recovery appeared lower than that of those who did not recover. Indeed, our sample's initial PCL scores were more consistent with Steenkamp et al.'s groups that either only made moderate recovery or demonstrated little recovery. Third, prior ASD studies have already shown that treatment results in better outcome than waitlist (e.g., Bryant et al., 2008). Other issues include the fact that there was a range in the number of clients seen by individual therapists, and different therapists delivered each treatment. Despite this, treatment fidelity and competency in the CPT group was good, and global clinician skills for all therapists were similarly rated positively. A number of clients with cognitive impairment and/or intellectual disability were excluded from the trial. The number of cases was unexpected, and

they were excluded due to the concern that they would not be able to complete what was sometimes an intensive amount of work over the course of 6 sessions. Clients with such difficulties, and those with mild-moderate traumatic brain injury, are able to complete CBT (see Bryant et al., 2003; Chard, Schumm, McIlvain, Bailey, & Parkinson, 2011), but clients may need simplified worksheets and more sessions. We have successfully used CPT with such clients but outside of trial conditions. We did not assess for personality disorders, thus the impact of this comorbidity on outcomes is unknown. Another limitation was the less than optimal retention for follow-ups. For the majority of clients, poor retention was due to their not being contactable. Although considerable effort was made to acquire multiple contact details, understandably due to the nature of the trauma, clients were sometimes unwilling to give alternative contact options.

In conclusion, the present study demonstrates that early intervention for posttraumatic stress following recent sexual assault is beneficial. The findings also indicate that a briefer format of CPT can be used effectively with a sexual assault sample, that it is associated with reductions in posttraumatic stress and depression, and is no more likely to result in adverse events compared with an unstructured, non-trauma focused counselling approach. Although replication is required, the modest effect size differences suggested that this brief CPT intervention format may be more beneficial to clients than a generic or eclectic counselling approach.

## Acknowledgments

This research was supported by an Australian Rotary Health Research Fund grant awarded to Reginald D.V. Nixon. The granting body had no role in the design, collection, analysis or interpretation of the data, or submission of the manuscript. Clinical trials registration number: ACTRN12611001065987 ([www.anzctr.org.au](http://www.anzctr.org.au)). We thank the clinicians and staff at Yarrow Place, the research assistants who assisted on the project, and the clients who were willing to participate in the trial.

## Endnotes

- 1 For recent survivors of trauma, it should be noted that these interventions are considered psychotherapy, not crisis or debriefing interventions (see McNally, Bryant, & Ehlers, 2003, for discussion).
- 2 Due to space considerations, more detailed information regarding methodology, statistical approach and some results is located in the online Supplementary Material.
- 3 Excluding these participants did not influence any findings, thus they were retained for analyses.
- 4 For pretreatment severity scores, the CAPS 'PTSD' score reflects the 17 items required for PTSD diagnosis without requiring that the trauma had occurred at least 1 month previously (given participants were being assessed in the ASD window, i.e., within 4 weeks of their trauma). Consistent with prior ASD treatment trials, posttreatment and later follow-ups fall into the window that PTSD (but not ASD) can be diagnosed.
- 5 In addition, defining a TAU treatment 'completer' that could be meaningfully compared with a CPT completer was essentially impossible. As reported in the Results, a large number of TAU clients continued to receive therapy following the 'posttreatment' assessment. Even if receiving 5–6 sessions was considered receiving complete treatment (for either group), the number of TAU clients who received such a treatment dose in the same time frame as CPT clients *without* receiving further sessions was too small ( $n = 2$ ) to conduct meaningful analysis.

6 Pooled results from the generalised linear models are not available as a number of the imputed data sets included 0% of TAU observations reaching good end-state functioning at 3-month follow-up.

## Supplementary material

To view supplementary material for this article, please visit <http://doi.org/10.1017/S081348391700002X>

## References

- Australian Centre for Posttraumatic Mental Health (ACPMH). (2013). *Australian Guidelines for the Treatment of Adults with Acute Stress Disorder and Posttraumatic Stress Disorder*. Melbourne, Australia: Author.
- Beck, A.T., Steer, R.A., & Brown, G.K. (1996). *Beck Depression Inventory — Second edition: Manual*. San Antonio, TX: Psychological Corporation.
- Becker, C.B., Zayfert, C., & Anderson, E. (2004). A survey of psychologist's attitudes towards and utilization of exposure therapy for PTSD. *Behaviour Research & Therapy*, 42, 277–292. doi:10.1016/S0005-7967(03)00138-4
- Blake, D.D., Weathers, F.W., Nagy, L.M., Kaloupek, D.G., Gusman, F.D., Charney, D.S., & Keane, T.M. (1995). The development of a clinician-administered PTSD scale. *Journal of Traumatic Stress*, 8, 75–90. doi:10.1002/jts.2490080106
- Benish, S.G., Imel, Z.E., & Wampold, B.E. (2008). The relative efficacy of bona fide psychotherapies for treating post-traumatic stress disorder: A meta-analysis of direct comparisons. *Clinical Psychology Review*, 28, 746–758. doi:10.1016/j.cpr.2007.10.005
- Bryant, R.A., Harvey, A.G., Dang, S.T., Sackville, T., & Basten, C. (1998). Treatment of acute stress disorder: A comparison of cognitive behavior therapy and supportive counseling. *Journal of Consulting and Clinical Psychology*, 66, 826–866. doi:10.1037/0022-006X.66.5.862
- Bryant, R.A., Mastrodomenico, J., Felmingham, K.L., Hopwood, S., Kenny, L., Kandris, E., . . . Creamer, M. (2008). Treatment of acute stress disorder: A randomised controlled trial. *Archives of General Psychiatry* 65, 659–667. doi:10.1001/archpsyc.65.6.659
- Bryant, R.A., Moulds, M., Guthrie, R., & Nixon, R.D.V. (2003). Treating acute stress disorder following mild traumatic brain injury. *American Journal of Psychiatry*, 160, 585–587. doi:10.1176/appi.ajp.160.3.585
- Bryant, R.A., Moulds, M., Guthrie, R. & Nixon, R.D.V. (2005). The additive benefit of hypnosis and cognitive-behavioral therapy in treating acute stress disorder. *Journal of Consulting and Clinical Psychology*, 73, 334–340. doi:10.1037/0022-006X.73.2.334
- Bryant, R.A., Moulds, M.L., & Nixon, R.V.D. (2003). Cognitive behaviour therapy of acute stress disorder: A four-year follow-up. *Behaviour Research and Therapy*, 41, 489–494. doi:10.1016/S0005-7967(02)00179-1
- Bryant, R.A., Moulds, M.L., Nixon, R.D., Mastrodomenico, J., Felmingham, K., & Hopwood, S. (2006). Hypnotherapy and cognitive behaviour therapy of acute stress disorder: A 3-year follow-up. *Behaviour Research and Therapy*, 44, 1331–1335. doi:10.1016/j.brat.2005.04.007
- Bryant, R.A., Sackville, T., Dang, S.T., Moulds, M., & Guthrie, R. (1999). Treating acute stress disorder: An evaluation of cognitive behavior therapy and supportive counseling techniques. *American Journal of Psychiatry*, 156, 1780–1786.
- 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. doi:10.1037/0022-006X.73.5.965
- Chard, K.M., Ricksecker, E.G., Healy, E.T., Karlin, B.E., & Resick, P.A. (2012). Dissemination and experience with cognitive processing therapy. *Journal of Rehabilitation Research & Development*, 49, 667–678. doi:10.1682/JRRD.2011.10.0198
- Chard, K.M., Schumm, J.A., McIlvain, S.M., Bailey, G.W., & Parkinson, R.B. (2011). Exploring the efficacy of a residential treatment program incorporating cognitive processing therapy-cognitive



- for veterans with PTSD and traumatic brain injury. *Journal of Traumatic Stress*, 24, 347–351. doi:[10.1002/jts.20644](https://doi.org/10.1002/jts.20644)
- Cook, J.M., Dinnen, S., Thompson, R., Simiola, V., & Schnurr, P.P. (2014). Changes in implementation of two evidence-based psychotherapies for PTSD in VA residential treatment programs: A national investigation. *Journal of Traumatic Stress*, 27, 137–143. doi:[10.1002/jts.21902](https://doi.org/10.1002/jts.21902)
- Cumming, G. (2008). Replication and *p* intervals: *p* values predict the future only vaguely, but confidence intervals do much better. *Perspectives on Psychological Science*, 3, 286–300. doi:[10.1111/j.1745-6924.2008.00079.x](https://doi.org/10.1111/j.1745-6924.2008.00079.x)
- Cumming, G. (2014). The new statistics: Why and how. *Psychological Science*, 25, 7–29. doi:[10.1177/0956797613504966](https://doi.org/10.1177/0956797613504966)
- deRoon-Cassini, T.A., Mancini, A.D., Rusch, M.D., & Bonanno, G.A. (2010). Psychopathology and resilience following traumatic injury: A latent growth mixture model analysis. *Rehabilitation Psychology*, 55, 1–11. doi:[10.1037/a0018601](https://doi.org/10.1037/a0018601)
- Devilley, G.J., & Borkovec, T.D. (2000). Psychometric properties of the credibility/expectancy questionnaire. *Journal of Behavior Therapy and Experimental Psychiatry*, 31, 73–86. doi:[10.1016/S0005-7916%2800%2900012-4](https://doi.org/10.1016/S0005-7916%2800%2900012-4)
- Ehlers, A., Bisson, J., Clark, D.M., Creamer, M., Pilling, S., Richards, D., . . . Yule, W. (2010). Do all psychological treatments really work the same in posttraumatic stress disorder? *Clinical Psychology Review*, 30, 269–276. doi:[10.1016/j.cpr.2009.12.001](https://doi.org/10.1016/j.cpr.2009.12.001)
- Elklit, A., & Christiansen, D.M. (2010). ASD and PTSD in rape victims. *Journal of Interpersonal Violence*, 25, 1470–1488. doi:[10.1177/0886260509354587](https://doi.org/10.1177/0886260509354587)
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149–1160. doi:[10.3758/BRM.41.4.1149](https://doi.org/10.3758/BRM.41.4.1149)
- Faulkner, C., Fidler, F., & Cumming, G. (2008). The value of RCT evidence depends on the quality of statistical analysis. *Behaviour Research and Therapy*, 46, 270–281. doi:<http://dx.doi.org/10.1016/j.brat.2007.12.001>
- Foa, E.B., Ehlers, A., Clark, D.M., Tolin, D.F., & Orsillo, S.M. (1999). The Posttraumatic Cognitions Inventory (PTCI): Development and validation. *Psychological Assessment*, 11, 303–314. doi:[10.1037/1040-3590.11.3.303](https://doi.org/10.1037/1040-3590.11.3.303)
- Foa, E.B., Hearst-Ikeda, D., & Perry, K.J. (1995). Evaluation of a brief cognitive-behavioral program for the prevention of chronic PTSD in recent assault victims. *Journal of Consulting and Clinical Psychology*, 63, 948–955. doi:[10.1037/0022-006X.63.6.948](https://doi.org/10.1037/0022-006X.63.6.948)
- Foa, E.B., Hembree, E.A., Cahill, S.P., Rauch, S.A., Riggs, D.S., Feeny, N.C., . . . Yadin, E. (2005). Randomized trial of prolonged exposure for posttraumatic stress disorder with and without cognitive restructuring: Outcome at academic and community clinics. *Journal of Consulting and Clinical Psychology*, 73, 953–964. doi:[10.1037/0022-006X.73.5.953](https://doi.org/10.1037/0022-006X.73.5.953)
- Foa, E.B., Zoellner, L.A., & Feeny, N.C. (2006). An evaluation of three brief programs for facilitating recovery after assault. *Journal of Traumatic Stress*, 19, 29–43. doi:[10.1002/jts.20096](https://doi.org/10.1002/jts.20096)
- Forbes, D., Lloyd, D., Nixon, R.D.V., 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. doi:[10.1016/j.janxdis.2012.01.006](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, 968–981. doi:[10.1037/a0030600](https://doi.org/10.1037/a0030600)
- Gilboa-Schechtman, E., Foa, E.B., Shafraan, N., Aderka, I.M., Powers, M.B., Rachamim, L., . . . Apter, A. (2010). Prolonged exposure versus dynamic therapy for adolescent PTSD: A pilot randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, 49, 1034–1042. doi:[10.1016/j.jaac.2010.07.014](https://doi.org/10.1016/j.jaac.2010.07.014)
- Kliem, S., & Kröger, C. (2013). Prevention of chronic PTSD with early cognitive behavioral therapy. A meta-analysis using mixed-effects modelling. *Behaviour Research and Therapy*, 51, 753–761. doi:[10.1016/j.brat.2013.08.005](https://doi.org/10.1016/j.brat.2013.08.005)

- Koucky, E.M., Galovski, T.E., & Nixon, R.D.V. (2012). Acute stress disorder: Conceptual issues and treatment outcomes. *Cognitive and Behavioral Practice*, 19, 437–450. doi:10.1016/j.cbpra.2011.07.002
- McNally, R.J., Bryant, R.A., & Ehlers, A. (2003). Does early psychological intervention promote recovery from posttraumatic stress? *Psychological Science in the Public Interest*, 4, 45–79. doi:10.1111/1529-1006.01421
- 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 post-traumatic stress disorder. *Journal of Consulting and Clinical Psychology*, 74, 898–907. doi:10.1037/0022-006X.74.5.898
- National Institute for Clinical Excellence (NICE). (2005). *Post-traumatic stress disorder: The management of PTSD in adults and children in primary and secondary care*. London: Gaskell and the British Psychological Society.
- Nixon, R.D.V. (2012). Cognitive processing therapy versus supportive counseling for acute stress disorder following assault: A randomized pilot trial. *Behavior Therapy*, 43, 825–836. doi:10.1016/j.beth.2012.05.001
- O'Donnell, M.L., Elliot, P., Lau, W., & Creamer, M. (2007). PTSD symptom trajectories: From early to chronic response. *Behaviour Research & Therapy*, 45, 601–606. doi:10.1016/j.brat.2006.03.015
- R Development Core Team. (2011). *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing.
- Raghunathan, T., & Dong, Q. (2013). Analysis of variance from multiply imputed data sets. Unpublished manuscript, Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, Michigan. Retrieved September 13, 2013, from <http://www-personal.umich.edu/~teraghu/Raghunathan-Dong.pdf>
- Resick, P.A. (1988). *Reactions of female and male victims of rape and robbery* (A final report; Grant No. 85-IJ-CX-0042). Washington, DC: National Institute of Justice.
- 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 post-traumatic stress disorder in female victims of interpersonal violence. *Journal of Consulting and Clinical Psychology*, 76, 243–258. doi:10.1037/0022-006X.76.2.243
- Resick, P.A., Monson, C.M., & Chard, K.M. (2007). *Cognitive processing therapy: Veteran/military version*. Washington, DC: Department of Veterans' Affairs.
- 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. doi:10.1037/0022-006X.74.5.898
- Resick, P.A., & Schnicke, M.K. (1992). Cognitive processing therapy for sexual assault victims. *Journal of Consulting and Clinical Psychology*, 60, 748–756. doi:10.1037/0022-006X.60.5.748
- Rothbaum, B., Foa, E., Riggs, D., Murdock, T., & Walsh, W. (1992). A prospective examination of post-traumatic stress disorder in rape victims. *Journal of Traumatic Stress*, 5, 455–475. doi:10.1002/jts.2490050309
- Rothbaum, B.O., Kearns, M.C., Price, M., Malcoun, E., Davis, M., Ressler, K.J., . . . Houry, D. (2012). Early intervention may prevent the development of posttraumatic stress disorder: A randomized pilot civilian study with modified prolonged exposure. *Biological Psychiatry*, 72, 957–963. doi:10.1016/j.biopsych.2012.06.002
- Russell, M., & Silver, S.M. (2007). Training needs for the treatment of combat-related posttraumatic stress disorder: A survey of department of defense clinicians. *Traumatology*, 13, 4–10. doi:10.1177/1534765607305440
- Schafer, J.L., & Graham, J.W. (2002). Missing data: Our view of the state of the art. *Psychological Methods*, 7, 147–177. doi:10.1037/1082-989X.7.2.147
- Schnurr, P.P., Friedman, M.J., Engel, C.C., Foa, E.B., Shea, M.T., Chow, B.K., . . . Bernardy, N. (2007). Cognitive behavioral therapy for posttraumatic stress disorder in women:

- A randomized controlled trial. *Journal of American Medical Association*, 297, 820–830. doi:[10.1001/jama.297.8.820](https://doi.org/10.1001/jama.297.8.820)
- Steenkamp, M.M., Dickstein, B.D., Salters-Pedneault, K., Hofmann, S.G., & Litz, B.T. (2012). Trajectories of PTSD symptoms following sexual assault: Is resilience the modal outcome? *Journal of Traumatic Stress*, 25, 469–474. doi:[10.1002/jts.21718](https://doi.org/10.1002/jts.21718)
- Tracey, T.J. & Kokotovic, A.M. (1989). Factor structure of the Working Alliance Inventory. *Psychological Assessment*, 1, 207–210. doi:[10.1037/1040-3590.1.3.207](https://doi.org/10.1037/1040-3590.1.3.207)
- van Buuren, S., & Groothuis-Oudshoorn, K. (2011). Mice: Multivariate imputation by chained equations in R. *Journal of Statistical Software*, 45, 1–67. Retrieved from <http://www.jstatsoft.org/v45/i03/>
- Wampold, B.E., Imel, Z.E., Laska, K.M., Benish, S., Miller, S.D., Flückiger, C., . . . Budge, S. (2010). Determining what works in the treatment of PTSD. *Clinical Psychology Review*, 30, 923–933. doi:[10.1016/j.cpr.2010.06.005](https://doi.org/10.1016/j.cpr.2010.06.005)
- Weathers, F., Litz, B., Herman, D., Huska, J., & Keane, T. (1993, October). *The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility*. Paper presented at the Annual Convention of the International Society for Traumatic Stress Studies, San Antonio, TX.
- Weathers, F.W., Ruscio, A.M., & Keane, T.M. (1999). Psychometric properties of nine scoring rules for the Clinician-Administered Posttraumatic Stress Disorder Scale. *Psychological Assessment*, 11, 124–133. doi:[10.1037/1040-3590.11.2.124](https://doi.org/10.1037/1040-3590.11.2.124)