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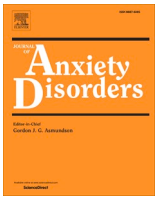

Comparing phase-based treatment, prolonged exposure, and skills-training for Complex Posttraumatic Stress Disorder: A randomized controlled trial

Peter Sele [a,b,*,1], Asle Hoffart [a,b], Marylène Cloitre [c,d], Elizabeth Hembree [e], Tuva Øktedalen [a]

[a] Research Institute, Modum Bad Psychiatric Hospital, Vikersund N-3370, Norway
[b] Department of Psychology, University of Oslo, Norway
[c] National Center for PTSD, Division of Dissemination and Training, VA Palo Alto Health Care System, CA 94025, USA
[d] Department of Psychiatry and Behavioral Sciences, Standford University, Stanford, CA 94305, USA
[e] Department of Psychiatry, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA 19104, USA

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ABSTRACT

Objective: This study examines treatment effects in STAIR Narrative Therapy (SNT), a phase-based treatment where Skills Training in Affective and Interpersonal Regulation (STAIR) precedes Narrative Therapy (NT), compared to Prolonged Exposure (PE) and to STAIR.
Method: Ninety-two adult patients diagnosed with DSM-5 PTSD and ICD-11 CPTSD following childhood abuse were randomly assigned to enhanced versions of SNT (12 group STAIR sessions + 8 individual NT sessions), PE (8–16 individual sessions), or STAIR (12 group STAIR sessions) provided in residential care. Outcome was assessed by mixed models.
Results: PE produced greater improvements in DSM-5 PTSD symptoms compared to SNT from pre-treatment to post-treatment, but not compared to STAIR. Reductions in ICD-11 CPTSD symptoms were not significantly different among conditions. From pre-treatment to 1 year follow-up, PE produced greater PTSD symptom improvements than SNT and STAIR, and PE and STAIR produced greater CPTSD symptom improvements than SNT.
Conclusions: The predicted stronger effect of SNT compared to PE and STAIR on DSM-5 PTSD and ICD-11 CPTSD symptoms was not supported by the findings. The benefits of immediate trauma-focused treatments (TFT) as compared to phase-based treatments, and the potential non-inferiority of skills-training as compared to TFT in CPTSD needs to be further investigated.

1. Introduction

Judith Herman (1992) described complex posttraumatic stress disorder (CPTSD) as a condition that develops in the aftermath of prolonged interpersonal trauma from which escape is difficult, or impossible. Herman proposed that repeated relational traumatization leads to pervasive problems beyond the scope of the PTSD diagnosis, including negative alterations of affects, self-perception, consciousness, and relational capacity. Reviews of cross-sectional, prospective, and retrospective studies on childhood abuse lend support to Herman's proposition that there is an increased risk for disturbances in social and emotion regulation capacities among adults with histories of chronic childhood abuse (Dvir et al., 2014; Messman-Moore & Bhuptani, 2017). The 11th revision of the International Classification of Diseases (ICD-11) was the first diagnostic manual that included CPTSD as a separate diagnosis, alongside PTSD. In ICD-11, the CPTSD diagnosis requires the presence of symptoms from each of three core PTSD symptom clusters (i.e., re-experiencing in the here and now, avoidance, and exaggerated perceptions of threat), and symptoms from each of three disturbances in self-organization (DSO) symptom clusters (i.e., affect dysregulation, negative self-concept, and disturbed relationships; World Health Organization, 2019).

However, the distinction of CPTSD as a separate diagnostic category has been a topic of considerable controversy (Brewin et al., 2017; Resick et al., 2012) and perspectives on treatment have been divergent. While the clinical guidelines for CPTSD from the International Society of Traumatic Stress Studies (ISTSS) recommend a personalized treatment approach tailoring interventions or series of interventions to the

* Corresponding author at: Research Institute, Modum Bad Psychiatric Hospital, Vikersund N-3370, Norway.
E-mail address: peter.sele@modum-bad.no (P. Sele).
[1] Cand.Psych (first author).

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patient's dominant problems (ISTSS, 2018), De Jongh et al. (2016) posit that already existing trauma-focused therapies for PTSD will be equally beneficial for CPTSD.

Findings regarding the impact of childhood abuse and complex PTSD symptoms on treatment effects have been mixed. Using data from a large randomized controlled trial (RCT), Resick et al. (2003) found that two trauma-focused psychotherapies, prolonged exposure (PE) and cognitive processing therapy (CPT), were equally effective in treating symptoms representative of complex PTSD symptoms in female rape survivors. Women with and without a history of childhood sexual abuse also improved significantly and comparably on PTSD and symptoms of complex PTSD. Meta-analyses support that trauma-focused treatments are effective approaches to childhood abuse related DSM PTSD (Ehring et al., 2014; McLean et al., 2022) but that the benefit relative to non-specific PTSD treatments may be attenuated in cases of repeated, intentional trauma (e.g., childhood abuse) as compared to PTSD related to circumscribed events (e.g., accidents; McLean et al., 2022). Aiming to gain insight into the treatment options for the recently introduced ICD-11 CPTSD diagnosis, Karatzias and colleagues (2019) reviewed fifty-one RCTs of psychological interventions for DSM PTSD, selecting studies where the patients were required to have predefined clinically significant baseline levels of one or more DSO symptom clusters. In line with the findings of Resick and colleagues (2003), trauma-focused therapies had moderate to large effects on both PTSD and DSO symptoms when compared to care as usual[2] (Karatzias et al., 2019). In contrast to the findings of Resick et al. (2003), moderator analyses indicated that individuals with childhood trauma obtained significantly less benefit than those without childhood trauma regarding PTSD symptoms as well as the DSO symptoms. Assuming that individuals with PTSD from a history of childhood abuse were likely to be representative of CPTSD, the data suggested that enhancements or additions to current trauma-focused treatments for PTSD might be of benefit for patients with CPTSD and should be investigated (Karatzias et al., 2019).

One alternative approach involves a multi-component treatment in which skills-training is integrated with trauma-focused interventions in a sequential procedure (Cloitre et al., 2002; Foy et al., 2002; Harned et al., 2012). Skills-training aims to strengthen the therapeutic bond, increase the patient's tolerance of distressing emotions, promote safe affect regulation strategies, and improve relational functioning. Underlying phased treatments is the assumption that improvement in these domains could contribute to increased benefits of trauma-focused interventions at a later stage (Cloitre et al., 2004). A systematic review and component network meta-analysis including 116 studies identified phase-based treatments as the most promising approach to two of the DSO symptom clusters (emotional dysregulation and interpersonal problems) and trauma-focused interventions as the best approach to PTSD symptoms (Coventry et al., 2020). Although the relative contribution of skills-training could not be feasibly evaluated (Coventry et al., 2020), this suggests a possible benefit of combining skills-training with exposure in the treatment of CPTSD.

Skills Training in Affect and Interpersonal Regulation (STAIR) is a flexible program adapted both for individual therapy and groups (Cloitre et al., 2020). STAIR aims to improve social adjustment and daily life function by a strengthening of interpersonal skills (e.g., flexibility in relationships) and related emotion regulation capacities (e.g., ability to regulate negative affect) within a cognitive-behavioural framework. STAIR Narrative Therapy (SNT) is a phase-based intervention where STAIR is followed by a modified version of imaginal exposure from PE called narrative therapy (NT; Cloitre et al., 2020). Initial RCTs of patients with childhood abuse and interpersonal violence related PTSD have found that individually delivered SNT reduced PTSD symptoms and improved negative mood regulation and interpersonal skills (Cloitre et al., 2002, 2010). One study investigated the relative contributions of each treatment component (Cloitre et al., 2010) and found that compared to supportive counselling followed by NT, SNT had less drop-out from treatment, fewer cases of symptom worsening during treatment and reduced PTSD symptoms at follow-up. These findings support the notion that a preceding skills-training phase may help patients benefit more from exposure therapy.

Three studies have examined STAIR (without NT) adapted for groups. Beneficial effects on PTSD symptoms and emotion regulation are reported in two open trials, one in individuals with childhood trauma treated in a community setting (MacIntosh et al., 2016) and a second in military veterans in primary care (Jackson et al., 2019). Similar findings were reported in a study comparing STAIR to treatment-as-usual for inpatients with PTSD and co-morbid schizoaffective disorder (Trappler & Newville, 2007).

More recently, four RCTs have examined the potential benefits of phased treatments over established trauma-focused interventions for patients with childhood abuse related DSM-5 PTSD. Comparing CPT to phase-based Dialectical Behavior Therapy for PTSD (DBT-PTSD), Bohus et al. (2020) found larger PTSD reductions in DBT-PTSD compared to CPT. Studies using STAIR as the phase 1 component include Oprel and colleagues (2021) comparing PE to intensified PE and STAIR followed by PE, Van Vliet et al. (2021) comparing EMDR to STAIR followed by EMDR, and Raabe and colleagues (2022) comparing Imagery Rescripting to STAIR followed by Imagery Rescripting. All three studies found large treatment effects in all treatment conditions. Inconsistent with the hypotheses, there were no significant differences in outcome between conditions in reduction of both DSM-5 PTSD and DSO symptoms. The studies vary in the degree to which the trauma-focused phase includes elements other than an exposure intervention (e.g., emotion regulation interventions in EMDR), potentially diluting the impact of a first phase of treatment. Overall, studies to date present different models of phase-based work in terms of both content and duration. Nevertheless, these studies support the use of PE, EMDR, and Imagery Rescripting to alleviate PTSD and DSO symptoms, and DBT-PTSD to alleviate PTSD and other problems indicative of complex symptomatology (e.g., dissociation and borderline symptoms).

To date, no studies have investigated the relative benefit of different therapy approaches for patients diagnosed with ICD-11 CPTSD. Given the mixed findings from studies of DSM PTSD samples, the potential benefits of phase-based treatment over standard trauma-focused interventions for ICD-11 CPTSD merit further examination. To our knowledge, no studies have included skills-training in groups, which is a widely offered and potentially cost-effective treatment format for childhood abuse survivors (Bækkelund et al., 2021; Sloan et al., 2013) as a comparator to phase-based interventions or exposure therapy. The present study was designed to fill these gaps in the literature.

This RCT compares the outcomes in SNT to PE and STAIR for patients with both an ICD-11 CPTSD and a DSM-5 PTSD diagnosis. While PE was developed for a broad spectrum of PTSD patients, SNT and STAIR may be of particular benefit to individuals with CPTSD symptoms. SNT explicitly addresses both symptom clusters in the ICD-11 CPTSD diagnosis (DSO and PTSD) in a sequenced procedure in which the skills training provided in the first phase has been shown to enhance the patients' ability to benefit from the following narrative component (Cloitre et al., 2004). On this basis we made the following hypothesis:

[2] No relevant studies that examined the effect of exposure therapy on affective dysregulation were found.

- SNT will be more effective in reducing DSM-5 PTSD and ICD-11 CPTSD symptoms than both PE and STAIR from pre- to post-treatment. These differences will be maintained at 1 year follow-up.

2. Method

2.1. Participants

Participants were recruited from referrals to a national clinic in Norway providing psychotherapy for childhood trauma related disorders in a residential setting. Patients are usually referred to this center due to unsatisfactory effect of prior treatment attempts in primary and secondary health care and have typically suffered from psychological problems and functional loss (e.g., full, or partial work incapacity) for several years at the time of referral. Referred individuals ($n = 248$) were invited in groups of 8–9 persons to a four-day admission at the center to assess eligibility for the study. At this pre-enrollment admission, the inclusion and exclusion criteria and demographic characteristics were assessed, and people received information about the study.

The inclusion criteria were similar to the established criteria at the clinic: a) age 18–65 years, b) exposure to childhood trauma, c) CPTSD diagnosis according to the ICD-11 criteria (World Health Organization, 2019), and d) PTSD diagnosis according to the DSM-5 criteria (American Psychiatric Association, 2013). Exclusion criteria were a) psychosis, b) complex dissociative disorder, c) substance abuse during the last three months, d) severe somatic illness (i.e., requiring hospitalization, e) acute suicidality, f) current life crisis (e.g., loss of a child, divorce), g) severely disturbed group functioning (e.g., hostile, or sexually inappropriate behavior), and h) mental disability.

Trauma exposure was reported on The Stressful Life Events Screening Questionnaire (Goodman et al., 1998). A preliminary version of The International Trauma Interview (ITI, test version 2.0) was used to confirm the presence of an ICD-11 CPTSD diagnosis (Bondjers et al., 2019; Roberts et al., 2016), and the Clinician Administered PTSD Scale (CAPS-5) was used to confirm the presence of a DSM-5 PTSD diagnosis (Weathers, Blake et al., 2013). Psychosis, substance abuse and suicidality were assessed with relevant sections of the MINI neuropsychological interview (Sheehan et al., 1998), and complex dissociative disorders with a section of the Dissociative subtype of PTSD interview (DSP-I; Eidhof et al., 2019). Group functioning, current life crises and mental disability were evaluated by clinical interviews and milieu observation, and somatic illness by medical examinations.

One hundred three participants who met criteria for the study were consented and were randomized to treatment condition: 37 to PE, 33 to STAIR, and 33 to SNT. These individuals returned home after the assessment visit to await study treatment. The waiting period between assessment visit and treatment start was variable (mean = 26 weeks, SD = 9.5) and was related to patient priority regulations in the public health system. Seven of 103 individuals did not return for treatment (see CONSORT flow chart for details) so were removed from the study. Of the 96 patients who returned to start treatment, four had lost study eligibility in the waiting period: three patients had already improved substantially and did not fulfil the diagnostic criteria for neither ICD-11 CPTSD nor DSM-5 PTSD, and one patient presented with a complex dissociative disorder, unrecognized at the initial assessment. These four patients were excluded from the study but did receive treatment at the clinic. This left 92 eligible participants constituting the intention-to-treat (ITT) sample, primarily female (80.4%) from Scandinavia (other ethnic origin; European = 6, Arab = 2, Hispanic = 1); 30 in SNT, 32 in PE, and 30 in STAIR. See Table 1 for full demographic details.

2.2. Procedure

The study is approved by the Norwegian Regional Ethical Committee (REK/2017/655) and pre-registered at ClinicalTrials.gov (NCT03509844). Patient recruitment started in September 2017 and the last 1-year follow-up data were collected in October 2021.[3] All participating patients signed an informed consent before enrollment. Of the 92 patients in the ITT sample, four dropped out before treatment was completed; two patients in SNT (due to medical conditions), and two patients in PE (one was admitted to an acute ward due to increased suicidality, and one declined to participate in the protocol interventions). We were unable to reach these four patients to conduct the planned post-treatment assessment. Three additional patients (two in

Table 1
Sample and group characteristics.

Characteristic	Total (n = 92)	SNT (n = 30)	PE (n = 32)	STAIR (n = 30)
Demographics				
Age, mean (SD)	42.9 (9.4)	44.3 (9.8)	42.5 (8.8)	41.7 (9.8)
Female, n (%)	74 (80.4)	26 (86.7)	25 (78.1)	23 (76.7)
Married or partner, n (%)	61 (66.3)	21 (70.0)	21 (65.6)	19 (63.3)
Children, n (%)	69 (75.0)	21 (70.0)	26 (81.3)	22 (73.3)
College level education* , n (%)	28 (31.5)	11 (39.3)	8 (25.8)	9 (30.0)
Occupational status				
Work incapacity, n (%)	55 (59.8)	18 (60.0)	21 (65.6)	16 (53.3)
Employed, full-time, n (%)	11 (12.0)	3 (10.0)	3 (9.4)	5 (16.7)
Employed, part-time, n (%)	24 (26.1)	8 (26.7)	7 (21.9)	9 (30.0)
Other, n (%)	2 (2.2)	1 (3.3)	1 (3.1)	0
Treatment history				
Age at first contact with mental health services, mean (SD)	27.8 (11.5)	28.3 (11.4)	27.9 (11.8)	27.1 (11.5)
Years of active treatment* *, mean (SD)	6.6 (3.4)	6.1 (2.2)	7.4 (4.5)	6.3 (3.4)
History of inpatient treatment, n (%)	49 (53.3)	18 (60.0)	18 (56.3)	13 (43.2)
Comorbidity				
MINI - comorbid axis-1 diagnoses, mean (SD)	3.1 (1.5)	3.1 (1.3)	3.3 (1.9)	2.7 (1.3)
MINI - depressive disorder, n (%)	53 (57.6)	18 (60.0)	19 (59.4)	16 (53.3)
MINI - bipolar disorder, n (%)	8 (8.7)	5 (16.7)	3 (9.4)	0
MINI - anxiety disorder, n (%)	62 (67.4)	23 (76.7)	20 (62.5)	19 (63.3)
MINI - eating disorder, n (%)	7 (7.6)	3 (10.0)	3 (9.4)	1 (3.3)
MINI - SUD, n (%)	3 (3.3)	1 (3.3)	2 (6.6)	0
CAPS - dissociative subtype of PTSD, n (%)	44 (47.8)	15 (50.0)	17 (53.1)	12 (40.0)

Note. * $n = 89$; * * $n = 75$; Abbreviations: SNT = Skills Training in Affect and Interpersonal Regulation Narrative Therapy; PE = Prolonged Exposure; STAIR = Skills Training in Affect and Interpersonal Regulation; CAPS-5 = Clinician-Administered PTSD Scale for DSM-5; MINI = Mini International Neuropsychiatric Interview; SUD = substance use disorders. Work incapacity = individuals not working and currently supported by social benefits

[3] As a Covid-19 prevention measure all patients at the hospital were discharged in March 2020. Eight patients in the STAIR arm and four patients in the PE arm had their treatments cut short by eight and six weeks, respectively. At this time, participants in the STAIR condition had received the first two STAIR sessions while participants in the PE condition on average had received 4 PE sessions (range 3–5) with an average of 2.25 sessions (range 1–3) including imaginal revisiting. We decided to offer new, full treatments to all twelve. The baseline CAPS scores for the twelve patients at the original treatment start and the new baseline CAPS scores at the readmittance in September 2020 were not significantly different, indicating that the patients had yet to profit substantially from treatment at the time it was interrupted. The data from the last, full treatment period are included in the analyses.

STAIR and one in SNT) declined to complete the main outcome interview at post-treatment. Out of the seven patients that did not complete the outcome interview at post-treatment, two completed the 1-year follow-up interview, while the remaining five were lost also to follow-up. In total, twenty-four patients were lost to follow-up: thirteen in SNT, seven in PE, and four in STAIR. All available data from the ITT-sample was used in the analyses (Fig. 1).

Independent and blindly rated outcome was assessed at treatment start, after 10 weeks (i.e., post-treatment for PE and STAIR) and after 16 weeks in SNT (i.e., post-treatment for SNT), and at 1 year follow-up. Self-reported outcomes were assessed at pre-treatment, post-treatment, and 1-year follow-up.[4]

2.3. Randomization

Patients were allocated to treatment based on random number sequences generated from www.random.org. Randomization procedures were conducted by an independent staff member and took place in blocks after the assessment admission. The size of the blocks varied dependent on the number of participants enrolled for study participation.

2.4. Treatment

This study was conducted in a clinic providing intensive treatment programs to patients in a residential setting. Structured, model-based interventions are delivered during daytime from Monday to Friday, but supportive consultations and medical assistance is available at all hours. Given limited staff resources in evenings, night-time, and weekends, the treatment context is not well-suited for patients with severe behaviour problems (e.g., aggressive, or sexualized behaviour). Patients entered in groups of eight or nine and were treated in one of two similar clinical units. The SNT and STAIR conditions were delivered in one unit (the Trauma unit) while PE was delivered in the other (the Anxiety unit). Some additions were made to the standard treatment protocols to take advantage of the residential treatment setting, all designed to strengthen the core therapeutic elements of each therapeutic model. Other elements of the treatment program (e.g., organized physical exercise twice a week) were equal across conditions.

2.4.1. STAIR Narrative Therapy (SNT)

This study used a group version of STAIR provided by two therapists as twelve 90-minute sessions over 10 treatment weeks, adapted from the original individual protocol by the treatment developers (Cloitre et al., 2020). All patients in the groups were study participants except patients excluded from analyses due to loss of eligibility (see 2.2 Procedure). In this study, STAIR for groups was strengthened as follows: First, the staff provided support and encouragement to help patients conduct the between-session homework assignments. Second, weekly 45-minute non-protocol individual therapy sessions were added to offer an opportunity for individual follow-up on the STAIR group material, along with other clinical topics.[5] The therapists were instructed to refrain from using trauma-focused interventions during the skills training (STAIR) phase.

Narrative Therapy (NT) is the second phase of SNT and includes eight 60-minute individual exposure sessions (mean number of provided NT sessions = 7.1, SD = 2.1, range 1–10). Imaginal reliving of trauma memories and cognitive restructuring of trauma-generated beliefs are the principal therapeutic components. NT does not include in-vivo exposure but rather incorporates continued use of interpersonal and emotion regulation skills work learned in the STAIR phase (Cloitre et al., 2020). The narrative work was supported by milieu staff that could aid patients with homework assignments (e.g., listening to taped therapy sessions).

2.4.2. Prolonged exposure (PE)

PE is a well-established treatment for PTSD (Foa et al., 2007). The main interventions of PE are repeated imaginal revisiting of traumatic memories and in-vivo exposures to safe but avoided situations, places, and activities that trigger trauma-related fear and distress. The standard protocol with a flexible number (8−16) of 90-minute individual treatment sessions (mean number of provided PE sessions = 12.1, SD = 2.37, range = 4–17) was followed. The core components of PE were strengthened in the following ways: First, the patient's contact nurse was present for some of the imaginal exposure sessions. If judged helpful to the process, the nurse could accompany and support the patient in the in-vivo work. Second, the staff provided support and encouragement to help patients conduct other between-session homework (e.g., listening to imagery revisiting parts of therapy recordings).

2.4.3. STAIR

STAIR was provided in groups with all adaptations described above for SNT but did not include the phase 2 narrative component.

2.5. Providers

The study therapists were eleven psychologists, two psychiatrists, and five trainees in psychiatry. Therapists from the Trauma unit were assigned to deliver both SNT and STAIR, while therapists from the Anxiety unit delivered PE only. Before entering the study, all therapists attended a two-day workshop or webinar in the model used in their unit (i.e., either SNT or PE) held by MC or EH, developer/expert of the respective models. MC and EH also provided weekly or bi-weekly online group supervision to the therapists throughout the treatment period. Collective and individual training and supervision needs were discussed, and therapists were offered individual follow-up as needed. The mean number of patients per therapist was 5.3 (SD = 2.25) for PE, 4.0 (SD = 1.60) for STAIR, and 3.6 (SD = 2.00) for SNT.

2.6. Treatment adherence

All protocol individual and group therapy sessions were videotaped. Videos representing a minimum of 10% of each therapist's total sessions were randomly drawn and rated for model adherence. Advanced level psychology students were trained to conduct the ratings according to assessment protocols provided by MC and EH. All videos were rated separately by two raters. In case of discrepancies a final decision was made by consensus.

2.6.1. STAIR

Fourteen STAIR videos were selected from a total of 96 sessions, and a set of essential therapy elements per session were rated as either "inadequate" = 0, "acceptable" = 1, or "excellent" = 2. The adherence to the STAIR protocol was high, with 91.5% of the essential elements present at "acceptable" (37.7%) or "excellent" (53.8%) level.

2.6.2. Narrative therapy

Twenty-seven videos were selected from a total of 248 sessions and rated on the same 0–2 scale as for STAIR. Adherence to the NT treatment protocol was satisfactory, with 83.2% of the essential elements delivered either at an "acceptable" (28%) or "excellent" (55.2%) level.

[4] A final, validated version of The International Trauma Questionnaire (ITQ), a self-report measure of ICD-11 CPTSD symptoms, was published after the trial was preregistered at ClinicalTrials.gov and was included as an outcome measure after pre-registration.

[5] The mean number of individual sessions supplementing the STAIR groups were 14.5 (SD = 1.2, range 12–17) in the STAIR condition, and 12.0 (SD = 2.9, range 6–19) in the SNT condition.

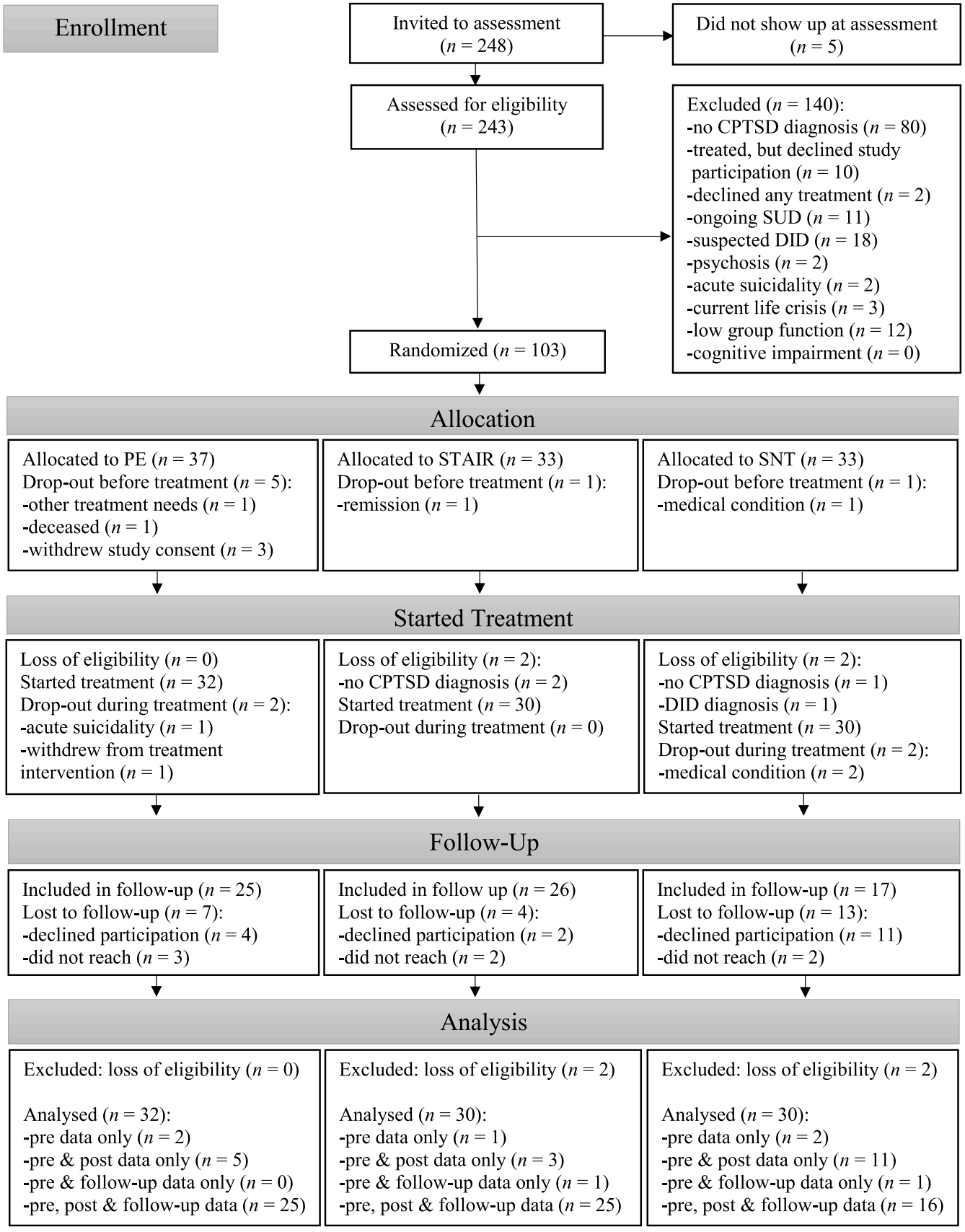

Fig. 1. Consolidated Standards of Reporting Trials (CONSORT) Flow Diagram.

2.6.3. Prolonged exposure

Thirty-five videos were selected from a total of 346. Essential therapy elements were rated as either "absent" or "present". Two-thirds (67.5%) of the essential elements were judged to be present. The overall rating of the therapists' adequacy regarding the essential elements fell between "satisfactory" and "good" on a five-point (1−5) Likert scale (mean = 3.35, SD = 1.14).

2.7. Measurement

2.7.1. Clinician Administered PTSD Scale (CAPS-5)

CAPS-5 is a clinician assessed instrument of PTSD symptoms adhering to the DSM-5 diagnostic criteria (Weathers et al., 2013). The CAPS-5 has 20 principal symptom items, scored from "absent" = 0, to "extreme/incapacitating" = 4, and summed to a total PTSD-severity score ranging from 0 to 80. An investigation of CAPS-5 scores found strong interrater and test-retest reliability and convergent validity to other PTSD measures, and satisfactory discriminant validity (Weathers et al., 2018).

Two external study collaborators that were kept blind to the study participants' treatment allocation conducted and scored the CAPS-5 interviews.[6] Both assessors received training and completed an online training program in PTSD assessment with the CAPS-5 (Clinician-Administered PTSD Scale for DSM-5 CAPS-5 Clinical Training, 2018) before the study started. The first 30 interviews were video-taped and scored independently. Kappa for diagnostic agreement was 1.00, and the ICC for the total CAPS-5 severity scores was .97.

2.7.2. The International Trauma Questionnaire (ITQ)

The ITQ is an 18-item self-report measure construed to assess PTSD and CPTSD in accordance with the ICD-11 criteria (Cloitre et al., 2018). The ITQ has 12 symptom items (six for PTSD and six for DSO) and six items measuring functional impairment. This study only included symptom items, scored on a five-point Likert scale ("not at all" = 0, "extremely" = 4). ITQ PTSD symptoms were represented by six highly similar items drawn from the PCL-5 (items 2 and 3 measure re-experiencing, items 6 and 7 measure avoidance, and items 17 and 18 measure sense of current threat).[7] ITQ DSO was measured by the original six ITQ-items. A total ITQ score was calculated as the sum of PTSD and DSO symptoms, ranging from 0 to 48. A study reported acceptable reliability for the ITQ (Sele et al., 2020). The baseline mean total score for the ITQ was 38.77 (SD = 9.15), and the baseline internal consistency was acceptable (Cronbach's α = .79).

2.7.3. The PTSD checklist for DSM-5 (PCL-5)

The PCL-5 (Weathers et al., 2013) is a self-report questionnaire for PTSD with 20 symptom items corresponding to the DSM-5 diagnostic criteria. Items are scored on a five-point Likert scale ("not at all" = 0, "extremely" = 4), providing a total sum score ranging from 0 to 80. The internal consistency, and convergent and discriminant validity of PCL-5 scores have been found to be satisfactory (Blevins et al., 2015; Weathers et al., 2018). The baseline mean score in this study was 54.52 (*SD* = 10.10) and baseline Cronbach's α = .84, indicating good internal consistency.

2.7.4. Beck Depression Inventory (BDI-II)

The BDI-II is a self-administered questionnaire with 21 items assessing depressive symptoms (Beck et al., 1996). Items are scored from "not at all" = 0, to "severely" = 3. A sum score ranging from 0 to 63 represents the severity of the depressive symptoms. BDI-II scores have been found to have high internal consistency, test-retest reliability, convergent validity, and adequate discriminant validity (Wang & Gorenstein, 2013). Mean depressive symptoms at baseline were in the severe range (Beck et al., 1996), 33.78 (SD = 10.55), and the Cronbach's α was .89, revealing good internal consistency.

2.7.5. Inventory of interpersonal problems (IIP-64)

The IIP-64 is a well-validated 64 items self-report instrument measuring distress stemming from interpersonal sources (Horowitz et al., 1988; Monsen et al., 2006). Items are reported on a five-point Likert scale ("not at all" = 0, "very much" = 4). The mean average score across items at baseline was 1.86 (SD =.42) and internal consistency was good, as indicated by a Cronbach's α at .90.

2.8. Statistical analyses

Potential differences between treatment conditions in trauma exposure, co-morbidity and demographic characteristics at baseline were examined using chi-square tests. Effect sizes were calculated as bias-corrected Hedges' *g* for dependant samples (Hedges, 1981).

The outcome data in this study are repeated measurements of continuous variables nested within patients.[8] Linear Mixed Models (LMM) were used to model overall outcome in DSM-5 PTSD symptoms (rated by blinded independent interviewers and self-report), and ICD-11 CPTSD symptoms, depression, and interpersonal problems (rated by self-report). With the LMMs we aimed to test the effects of each treatment condition in the format proposed in the treatment manuals, irrespective of the differences in duration. To achieve this, we used a piecewise model with two linear slopes where the first slope modelled change in the "active treatment" period from pre-treatment to post-treatment (i.e., week 1–16 in SNT compared to week 1–10 in PE and STAIR), and the second slope modelled change in the "follow-up" period (i.e., from post-treatment to 1-year follow-up). Additionally, we specified LMM models with one slope from pre-treatment to follow-up (i.e., without the post-treatment scores) to examine overall change from treatment start to one year after treatment. Fixed effects of time, treatment, and time by treatment interactions were entered as predictors in the models, providing comparisons of all three treatment arms to one another. We used unstructured covariance matrices for the residuals. All LMM analyses were conducted in SPSS version 27 with the restricted maximum likelihood (REML) estimator.[9] The mixed model analyses were complemented with two clinically useful measures: rates of loss of diagnosis and reliable change. Loss of DSM-5 PTSD and ICD-11 CPTSD diagnosis from pre- to posttreatment was calculated based on the diagnostic algorithms of the CAPS-5 and the ITQ, respectively. Reliable improvement or worsening from pre- to post-treatment was assessed as a change in observed symptoms scores (decline or increase) that exceeded a threshold defined by chance variation and each test's reliability (Christensen & Mendoza, 1986). This was calculated as 1.96 x SD [pre-test] x sqrt2(1-reliability), and yielded a minimum reliable change score of 8.53 for the ITQ and 10.23 for the CAPS-5. Since symptoms are reported as whole numbers the reliable change scores were rounded conservatively to 9 and 11, respectively.

[6] The majority of the outcome interviews were conducted face to face, but Covid-19 related social distancing measures demanded the use of video-links and telephone to conclude the last phase of interviews.

[7] Further explanation of the decision to base ITQ PTSD calculations on these six PCL-5 items is provided in the Supplemental Materials.

[8] Patients were treated in groups of 8 or 9 individuals. A supplementary ANOVA examining the effects of groups membership nested within treatment condition indicated that the group factor was only modestly and not significantly related to outcome (See table 4 in the Supplemental Material). Thus, potential group effects were not included in the LMMs to avoid loss of study power.

[9] Missing data are described under procedure, in the study flow-chart and in the Supplemental Materials.

3. Results

The participants sociodemographic characteristics and co-morbid Axis-I disorders are presented in Table 1 and trauma-exposure in Table 2. Chi-square tests indicated no significant differences in sociodemographic factors or co-morbidity between the treatment conditions. There was a higher incidence of reported repeated physical violence in adulthood in the PE and the SNT arms compared to the STAIR arm. There were no other significant differences in reported trauma exposure between the conditions.

Table 2
Traumatic exposure.

Traumatic experiences, age, and frequency	Total ($n = 88$)	SNT ($n = 30$)	PE ($n = 30$)	STAIR ($n = 28$)
Life-threatening illness	9 (10.2%)	3 (10.0%)	2 (6.7%)	4 (14.3%)
Age, mean (SD)	24.4 (9.6)	16 (14.1)	25.0 (7.1)	29.7 (6.4)
Life-threatening accident	14 (16.1%)	5 (16.7%)	2 (6.9%)	7 (25.0%)
Age, mean (SD)	29.0 (10.8)	35.8 (11.1)	30.5 (6.4)	23.7 (9.5)
Robbery	25 (28.4%)	12 (40.0%)	7 (23.3%)	6 (21.4%)
Age, mean (SD)	19.0 (8.3)	17.8 (9.2)	23.3 (4.4)	16.5 (9.1)
Sudden death of a close person	43 (48.9%)	15 (50.0%)	15 (50.0%)	13 (46.4%)
Age, mean (SD)	24.5 (11.2)	23.9 (11.8)	21.6 (9.4)	27.8 (12.0)
Sexual abuse				
Penetration	72 (81.8%)	25 (83.3%)	26 (86.7%)	21 (75%)
Age, mean (SD)	10.9 (8.2)	12.4 (9.2)	10.4 (8.1)	9.5 (7.1)
> 10 times	40 (60.6%)	14 (60.9%)	17 (70.8%)	9 (47.4%)
Other	45 (51.1%)	14 (46.7%)	18 (60.0%)	13 (46.4%)
Age, mean (SD)	9.6 (6.3)	10.1 (5.1)	8.9 (8.3)	8.9 (5.0)
> 10 times	22 (59.5%)	6 (66.7%)	9 (60%)	7 (53.8%)
Physical abuse				
< 18 years	62 (70.5%)	21 (70.0%)	19 (63.3%)	22 (78.6%)
Age, mean (SD)	5.7 (3.5)	5.7 (3.5)	5.9 (4.0)	5.4 (3.2)
> 10 times	39 (68.4%)	11 (57.9)	14 (82.4%)	14 (66.7%)
> 18 years*	42 (47.7%)	16 (53.3%)	19 (63.3%)	7 (25.0%)
> 10 times	11 (28.9%)	3 (21.4%)	8 (44.4%)	0
Emotional abuse	74 (84.1%)	24 (80.0%)	27 (90.0%)	23 (82.1%)
Age, mean (SD)	8.4 (8.3)	6.1 (6.5)	11.8 (10.5)	6.5 (5.2)
> 10 times	63 (94.0%)	20 (95.2%)	22 (91.7%)	21 (95.5%)
Threatened by weapon	21 (23.9%)	8 (26.7%)	6 (20.0%)	7 (25.0%)
Age, mean (SD)	19.5 (10.5)	17.8 (7.0)	20.5 (14.4)	21.2 (11.9)
Witness to trauma	55 (62.5%)	19 (63.3%)	20 (66.7%)	16 (57.1%)
Age, mean (SD)	10.6 (7.4)	9.7 (5.9)	12.4 (9.1)	8.9 (5.8)
Other life-threatening or horrifying situations	65 (73.9%)	24 (80.0%)	18 (60.0%)	23 (82.1%)
Age, mean (SD)	19.2 (13.3)	15.6 (11.5)	21.6 (12.5)	20.3 (15.2)

Note. Age = age at first incident; Frequencies of patients reporting over 10 episodes are presented as percentages of positive responses in each trauma category,
* Pearson Chi-Square = 9.104 ($p = 0.011$).

Table 3 displays the mean scores and standard deviations of the primary and secondary outcomes at pre-treatment, post-treatment and 1 year follow-up, effect sizes (Hedges' *g*) from pre- to post-treatment and from pre-treatment to follow-up, linear change, and time by treatment interactions from pre- to post-treatment, from post-treatment to 1 year follow-up, and from pre-treatment to 1 year follow-up.

3.1. Symptoms change within conditions

The symptom levels at treatment start were not significantly different in the conditions. DSM-5 PTSD symptoms (independently assessed and self-reported) and self-reported ICD-11 CPTSD symptoms showed significant improvement from pre- to post-treatment in PE and STAIR while SNT did not. Likewise, depressive symptoms improved from pre- to post-treatment in PE and STAIR but not in SNT. In the same period, interpersonal problems did not change significantly in any condition. From post-treatment to 1-year follow-up, there were no significant changes on any measure in any condition, indicating that symptoms remained relatively stable in the year following treatment. Looking at overall change from pre-treatment to 1 year follow-up, independently assessed PTSD symptoms as well as self-reported depression and interpersonal problems were significantly reduced only in PE, while self-reported PTSD and CPTSD symptoms were significantly reduced in PE and STAIR but not in SNT.

3.2. Comparisons of symptoms change between conditions

The interaction effects of time from pre- to post-treatment by treatment condition revealed a significantly larger decline in DSM-5 PTSD symptoms (both independently rated and self-reported) for PE as compared to SNT, but no differences between PE and STAIR, or SNT and STAIR. There were no differences across the three conditions for ICD-11 CPTSD symptoms. PE was superior to SNT for depressive symptoms, with no differences between SNT and STAIR, or PE and STAIR. Regarding interpersonal problems, there were no significant differences between any of the conditions from pre-treatment to post-treatment. From post-treatment to follow-up, all comparisons among conditions were non-significant, indicating that none of the symptom measures changed differently in the three conditions in the year after treatment. Overall symptoms reductions from pretreatment to follow-up were, however, larger in PE compared to SNT for all outcomes. Independently rated DSM-5 PTSD symptoms declined more in PE also when compared to STAIR from pretreatment to follow-up, while changes in self-rated DSM-5 PTSD, ICD-11 CPTSD, depression and interpersonal problems were not significantly different in PE and STAIR. Comparing SNT and STAIR in the same period, CPTSD symptoms improved more in STAIR, with no significant differences on other outcomes.

3.3. Loss of diagnosis and reliable symptoms change

One out of four lost DSM-5 PTSD diagnosis at post-treatment (SNT = 11%, PE = 43%, STAIR = 18%). Significantly more participants in the PE condition lost PTSD diagnosis, both as compared to SNT ($\chi^2 = 7.31$, df = 1, $p = .007$) and as compared to STAIR ($\chi^2 = 4.39$, df = 1, $p = .036$), while loss of diagnosis was not significantly different in SNT and STAIR ($\chi^2 = 0.50$, df = 1, $p = .478$). PTSD symptoms decreased reliably in 19% of the participants in SNT, 33% in PE, and 18% in STAIR from pre-treatment to post-treatment, and these rates were not significantly different among conditions, SNT vs. PE ($\chi^2 = 1.61$, df = 1, $p = .205$), SNT vs. STAIR ($\chi^2 = 0.00$, df = 1, $p = .949$), and STAIR vs PE ($\chi^2 = 1.81$, df = 1, $p = .179$). No patients had reliably worsened DSM-5 PTSD symptoms.

Half of the participants lost ICD-11 CPTSD diagnosis at post-treatment (SNT = 42%, PE = 63%, STAIR = 50%), while the proportion of patients who lost CPTSD diagnosis was not significantly different

Table 3
Means, effect sizes, and mixed linear models with fixed effects of time and time x treatment comparisons.

	Mean (SD)			Effect size, Hedges' *g*		Mixed piecewise linear models				Mixed linear models	
Measure	Pre	Post	1yFU	Pre - Post	Pre – 1yFU	Pre – Post, β (SE)	*P*	Post - 1yFU, β (SE)	*P*	Pre - 1yFU, β (SE)	*P*
Clinician Administered PTSD Scale											
SNT	44.5 (6.82)	40.4 (12.09)	42.1 (18.05)	0.36	0.13	-3.76 (2.03)	.068	3.56 (2.89)	.221	-1.06 (3.13)	.735
PE	46.1 (8.23)	34.7 (15.58)	36.0 (17.48)	0.81	0.64	-10.63 (1.93)	< .001	0.22 (2.39)	.925	-10.59 (2.59)	< .001
STAIR	41.4 (7.96)	36.4 (11.36)	37.4 (12.63)	0.47	0.34	-5.18 (1.99)	.011	2.12 (2.38)	.378	-3.15 (2.54)	.219
Comparisons											
SNT vs PEa	NA	NA	NA	NA	NA	-6.88 (2.80)	.016	-3.34 (3.75)	.376	-9.53 (4.06)	.022
SNT vs STAIRb						-1.42 (2.84)	.618	-1.45 (3.74)	.700	-2.09 (4.03)	.606
STAIR vs PEc						-5.45 (2.78)	.053	-1.89 (3.38)	.577	-7.44 (3.63)	.044
International Trauma Questionnaire -Total											
SNT	34.1 (5.40)	30.8 (9.07)	35.1 (9.44)	0.38	-0.12	-3.16 (1.60)	.052	3.83 (2.23)	.090	.636 (2.38)	.790
PE	33.8 (6.99)	24.4 (12.05)	24.8 (11.79)	0.81	0.83	-7.70 (1.77)	< .001	0.31 (2.28)	.891	-8.64 (2.34)	< .001
STAIR	33.2 (7.71)	28.6 (10.93)	27.3 (11.64)	0.45	0.55	-4.54 (1.47)	.003	-1.95 (1.89)	.307	-6.25 (2.06)	.004
Comparisons											
SNT vs PEa	NA	NA	NA	NA	NA	-4.55 (2.39)	0.60	-3.52 (3.19)	.273	-9.27 (3.34)	.007
SNT vs STAIRb						-1.39 (2.17)	.524	-5.78 (2.92)	.052	-6.88 (3.15)	.033
STAIR vs PEc						-3.16 (2.30)	.173	2.26 (2.96)	.448	-2.39 (3.12)	.446
Posttraumatic Stress Disorder Checklist for *DSM-5*											
SNT	53.2 (8.02)	50.1 (13.62)	52.6 (16.74)	0.25	0.04	-3.14 (2.56)	.225	3.14 (2.63)	.237	0.24 (3.28)	.942
PE	57.0 (9.92)	43.8 (18.74)	40.1 (18.76)	0.78	1.02	-12.41 (2.81)	< .001	-2.24 (2.49)	.371	-16.11 (2.95)	< .001
STAIR	52.7 (12.32)	45.9 (16.10)	43.7 (16.74)	0.45	0.58	-6.72 (2.47)	.008	-2.55 (2.29)	.270	-8.23 (2.93)	.007
Comparisons											
SNT vs PEa	NA	NA	NA	NA	NA	-9.27 (3.80)	.017	-5.39 (3.62)	.142	-16.35 (4.41)	< .001
SNT vs STAIRb						-3.58 (3.56)	.319	-5.69 (3.49)	.108	-8.47 (4.36)	.058
STAIR vs PEc						-5.70 (3.74)	.131	0.30 (3.38)	.929	-7.88 (4.16)	.062
Beck Depression Inventory -II											
SNT	32.7 (8.21)	32.2 (13.81)	31.3 (16.10)	0.03	0.07	-0.45 (1.97)	.821	3.18 (2.75)	.253	2.24 (3.06)	.466
PE	36.6 (9.37)	28.7 (16.62)	28.6 (17.04)	0.46	0.48	-7.84 (1.92)	< .001	1.48 (2.27)	.517	-7.57 (2.49)	.004
STAIR	31.5 (12.77)	27.4 (12.77)	28.8 (11.71)	0.31	0.21	-4.11 (1.88)	.032	0.06 (2.37)	.979	-3.87 (2.60)	.143
Comparisons											
SNT vs PEa	NA	NA	NA	NA	NA	-7.40 (2.75)	.009	-1.70 (3.57)	.635	-9.82 (3.94)	.016
SNT vs STAIRb						-3.66 (2.73)	.182	-3.12 (3.63)	.859	-6.11 (4.01)	.134
STAIR vs PEc						-3.73 (2.69)	.168	1.42 (3.28)	.667	-3.71 (3.60)	.308
Inventory of Interpersonal Problems - 64											
SNT	1.86 (0.44)	1.95 (0.59)	1.75 (0.73)	-0.20	0.11	0.11 (0.08)	.178	-0.09 (0.11)	.398	0.02 (0.11)	.873
PE	1.92 (0.43)	1.80 (0.69)	1.54 (0.69)	0.18	0.65	-0.10 (0.08)	.183	-0.18 (0.09)	.053	-0.34 (0.09)	< .001
STAIR	1.81 (0.42)	1.81 (0.48)	1.68 (0.43)	0.00	0.29	-0.00 (0.08)	.994	-0.14 (0.09)	.136	-0.16 (0.10)	.103
Comparisons											
SNT vs PEa	NA	NA	NA	NA	NA	-0.21 (0.11)	.060	-0.09 (0.14)	.540	-0.35 (0.15)	.018
SNT vs STAIRb						-0.11 (0.11)	.327	0.05 (0.14)	.728	-0.18 (0.15)	.237
STAIR vs PEc						-0.10 (0.11)	.343	-0.04 (0.13)	.779	-0.18 (0.13)	.185

Note. Abbreviations: Pre = pre-treatment; Post = end of treatment (16 weeks for SNT, and 10 weeks for STAIR and PE); 1yFU = one year follow-up; SNT, Skills Training in Affect and Interpersonal Regulation Narrative Therapy; STAIR, Skills Training in Affect and Interpersonal Regulation; PE, Prolonged Exposure; NA, not applicable; PTSD, posttraumatic stress disorder; SD = Standard deviation; β = beta-coefficient; SE = Standard error; *P* = p-value. Hedges' *g* = bias-corrected Hedges' *g* for dependent samples. Posttraumatic Stress Disorder Checklist for DSM-5 items (2, 3, 6, 7, 17, and 18) were used to replace the International Trauma Questionnaire PTSD items in the calculations of the International Trauma Questionnaire - Total score. [a] = Treatment is coded as 0 for SNT and 1 for PE, [b] = Treatment is coded as 0 for SNT and 1 for STAIR, [c] = Treatment is coded as 0 for STAIR and 1 for PE.

among conditions, SNT vs. PE ($\chi^2 = 2.04$, df = 1, $p = .153$), SNT vs. STAIR ($\chi^2 = 0.33$, df = 1, $p = .565$), and STAIR vs. PE ($\chi^2 = 0.84$, df = 1, $p = .358$). CPTSD symptoms improved reliably in 22% of the participants in the SNT condition, in 41% in PE, and in 25% in STAIR from pre- to post-treatment. The proportion of patients with reliable CPTSD symptoms decrease was not significantly different among conditions, SNT vs. PE ($\chi^2 = 1.65$, df = 1, $p = .199$), SNT vs STAIR ($\chi^2 = 0.35$, df = 1, $p = .852$), and STAIR vs. PE ($\chi^2 = 1.90$, df = 1, $p = .169$). Two participants, one in SNT and one in PE, had reliably worsened CPTSD symptoms from pre- to post-treatment.

4. Discussion

The main hypothesis of this study, predicting a stronger overall effect of SNT compared to PE and STAIR on both DSM-5 PTSD and ICD-11 CPTSD symptoms, was not supported by the findings. The between-treatment analyses showed that PE significantly outperformed SNT on DSM-5 PTSD symptoms reduction, with no significant differences between SNT and STAIR. PE outperformed SNT on loss of PTSD diagnosis, while there were no significant differences among conditions on reliable PTSD symptoms change. Regarding self-reported ICD-11 CPTSD symptoms the picture was less clear: Both PE and STAIR outperformed SNT from pre-treatment to follow-up, but not from pre-treatment to post-treatment, or post-treatment to follow-up. Neither loss of ICD-11 CPTSD diagnosis, or reliable symptoms change differed significantly among conditions. On secondary outcomes of depression and interpersonal problems, PE was superior to SNT, while there were no significant differences between SNT and STAIR.

Previous studies in childhood abuse related DSM PTSD samples have found large and comparable effects in phase-based and established trauma-focused interventions (Cloitre et al., 2010; Oprel et al., 2021; Raabe et al., 2022; Van Vliet et al., 2021). The contrast to the more modest effects reported in this study is perhaps attributable to enrollment based on ICD-11 CPTSD (Karatzias et al., 2019), however, the differences among conditions were unexpected and may contribute to the investigation of the treatment needs in this patient population.

This study examined each treatment in versions proposed to be optimal by the treatment developers and therefore compared conditions that by design were different, both in content and duration. SNT was the most extensive of the three conditions, still, more therapy time was devoted to trauma-focused work in PE. The exposure phase in SNT was shorter (6 weeks in NT vs. 8–9 weeks in PE), contained fewer sessions (mean 7.1 in NT vs. mean 12.1 in PE), each of a shorter duration (60 min in NT vs. 90 min in PE). Supporting the notion that sufficient time devoted to trauma memory processing may be key to change in CPTSD, a pilot study using an individually delivered, flexible application of SNT found large treatment effects when therapists could add sessions based on their clinical judgement of the clients' needs (Niwa et al., 2022).

Additionally, the SNT protocol includes skills practice between sessions rather than systematic in-vivo exposure, which is a central part of PE (Hembree & Foa, 2020). The outcome differences found in this study could reflect that the combination of imagery processing and in-vivo exposure in PE is particularly useful for CPTSD patients.

Inspection of the outcome for each condition indicates that STAIR alone provided significant reduction in symptoms while STAIR and NT together did not. STAIR was delivered in both conditions in the same way and by the same therapists. The absence of effectiveness of STAIR in the context of SNT but not alone needs further investigation.

Comparing STAIR to PE, loss of DSM-5 PTSD diagnosis and PTSD symptoms reduction from pretreatment to follow-up based on independent assessments favoured PE, but we found no other differences (e.g., on self-reported DSM-5 PTSD or ICD-11 CPTSD). Meta-analyses of treatment interventions for PTSD have found more modest effects from group interventions compared to individual interventions (Ehring et al., 2014; Sloan et al., 2013), and more modest effects from non-trauma focused interventions compared to trauma-focused interventions (Ehring et al., 2014). While our results demonstrate that PE is likely the stronger approch to DSM-5 PTSD and the treatment duration was equal in both conditions (10 weeks), therapist resources used in STAIR (group and individual sessions) was slightly lower compared to PE (individual sessions). In line with our findings, the relative benefits of trauma-focused treatments over non-trauma focused treatments for PTSD have been found to be smaller in cases of repeated, relational trauma (McLean et al., 2022) and complex symptomatology (Gerger et al., 2014), similar to the patients included in this study. Thus, skills-training interventions used alone (i.e., not as part of a phase-based treatment) could be a cost-effective treatment alternative and relevant for future investigations of ICD-11 CPTSD.

A major strength of this study is the inclusion of patients based on a clinician-rated assessment of ICD-11 CPTSD. Other strengths include the following. The residential treatment setting afforded several enhancements to key protocol elements, including available support from milieu staff while engaging in challenging between-session assignments, and weekly therapy sessions allowing for individual elaboration of the STAIR group material. Several measures were taken to control for confounding variables. Training and supervision were provided by treatment experts to an equal extent in the different conditions, treatment integrity checks were based on ratings of therapy videos and conducted by assessors outside the study group, and outcome assessors were blinded to treatment condition.

This study also has several limitations, including the exclusion of sub-populations of patients with severe co-morbidity (e.g., active substance abuse) and behaviour problems (e.g., aggressive, or sexual approaches to other patients) for which the treatment context was not suited. This limits the generalizability of our findings with regards to some of the patient groups that may be particularly likely to profit from adaptations of established trauma-focused treatments. The extensive waiting period between study enrolment and treatment start was imposed by patient priority demands of the treatment setting and not study related, but nonetheless may have introduced a risk of selective attrition that could have influenced our findings. Because this study compared treatments of different length the assessment points used in the analyses (i.e., post-treatment and 1 year follow-up) do not reflect equal amounts of time elapsed. A differential effect related to time in treatment can therefore not be ruled out; however, the results suggest that the longer treatment duration in SNT compared to PE and STAIR was disadvantageous. A final, validated version of the ITQ was not available when the trial was pre-registered but was included after pre-registration. Patients are referred to the clinic because they have failed to profit from earlier outpatient treatment attempts. Thus, the study sample may be more chronic and less likely to benefit from psychotherapy than CPTSD patients in general. PE was provided by therapists in the Anxiety Unit, while SNT and STAIR were provided by therapists in the Trauma Unit. This involves a risk of confounding the effects of treatment condition with therapist effects or contextual effects (e.g., each unit's clinical culture). The assessments of treatment integrity indicated that protocol adherence was acceptable in all three conditions, lessening the likelihood of therapist-related differences in treatment

implementation. However, there is a difference in clinical tradition in the two units involved. While the Anxiety unit routinely offers exposure-based treatments separate from the current study, the Trauma unit primarily provides stabilization focused skills-training programs. We cannot rule out differences in the culture or tradition of these two units and especially familiarity with exposure interventions, that may have influenced our findings. For unknown reasons, attrition at follow-up was larger in SNT compared to the other two study conditions.

In sum, PE and STAIR were both effective. Despite being a shorter treatment, PE reduced DSM-5 PTSD symptoms and long-term ICD-11 CPTSD symptoms more effectively than SNT. This suggests that among CPTSD patients, DSO symptoms may be addressed and resolved during exposure therapy and that immediate exposure may be the better way to address the PTSD part of CPTSD. How much our findings may have been influenced by different dosages of exposure in PE and SNT, the use of in-vivo exposure in PE but not in SNT, or other factors, are important inquires for future studies. The non-inferiority of mixed modality skills-training interventions (i.e., groups enhanced by individual sessions) to individual trauma-focused interventions in CPTSD should be examined given the potential public health advantages.

Furthermore, the results demonstrated significant individual variability in treatment outcomes and a majority of patients did not achieve reliable symptom improvement. Research efforts aiming to identify which intervention is most suitable for what patient hold promise for patients with PTSD (Herzog & Kaiser, 2022; Hoeboer et al., 2021) and are likely a promising approach to help more patients with CPTSD profit from therapy. The results also suggest a need to develop or adapt existing interventions to improve overall treatment outcomes (Karatzias et al., 2019). As the current study is the first randomized controlled treatment study to include patients based on the ICD-11 CPTSD criteria, future studies in different CPTSD samples and treatment contexts are required to judge the replicability of our findings.

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Declaration of Competing Interest

None.

Data availability

Data will be made available on request.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.janxdis.2023.102786.

References

American Psychiatric Association, 2013, Diagnostic and statistical manual of mental disorders (5th ed.). https://doi.org/10.1176/appi.books.9780890425596.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. TX: Psychological Corporation,.

Bækkelund, H., Karlsrud, I., Hoffart, A., & Arnevik, E. A. (2021). Stabilizing group treatment for childhood-abuse related PTSD: a randomized controlled trial. *European Journal of Psychotraumatology, 12*(1), 1859079. https://doi.org/10.1080/20008198.2020.1859079

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The posttraumatic stress disorder checklist for DSM-5 (PCL-5): development and initial psychometric evaluation. *Journal of Traumatic Stress, 28*(6), 489–498. https://doi.org/10.1002/jts.22059

Bohus, M., Kleindienst, N., Hahn, C., Müller-Engelmann, M., Ludäscher, P., Steil, R., Fydrich, T., Kuehner, C., Resick, P. A., Stiglmayr, C., Schmahl, C., & Priebe, K. (2020). Dialectical Behavior Therapy for Posttraumatic Stress Disorder (DBT-PTSD) Compared With Cognitive Processing Therapy (CPT) in Complex Presentations of PTSD in Women Survivors of Childhood Abuse: A Randomized Clinical Trial. *JAMA Psychiatry, 77*(12), 1235–1245. https://doi.org/10.1001/jamapsychiatry.2020.2148

Bondjers, K., Hyland, P., Roberts, N. P., Bisson, J. I., Willebrand, M., & Arnberg, F. K. (2019). Validation of a clinician-administered diagnostic measure of ICD-11 PTSD and Complex PTSD: the International Trauma Interview in a Swedish sample. *European Journal of Psychotraumatology, 10*(1). https://doi.org/10.1080/20008198.2019.1665617

Brewin, C. R., Cloitre, M., Hyland, P., Shevlin, M., Maercker, A., Bryant, R. A., Humayun, A., Jones, L. M., Kagee, A., Rousseau, C., Somasundaram, D., Suzuki, Y., Wessely, S., van Ommeren, M., & Reed, G. M. (2017). A review of current evidence regarding the ICD-11 proposals for diagnosing PTSD and complex PTSD. *Clinical Psychology Review, 58*, 1–15. https://doi.org/10.1016/j.cpr.2017.09.001

Christensen, L., & Mendoza, J. L. (1986). A method of assessing change in a single subject: An alteration of the RC index. *Behavior Therapy, 17*(3), 305–308. https://doi.org/10.1016/S0005-7894(86)80060-0

Clincian-Administered PTSD Scale for DSM-5 (CAPS-5) Clinical Training, 2018, Veterans Health Administration - Employee Education System. ⟨https://www.train.org/main/course/1068095/⟩.

Cloitre, M., Cohen, L. R., Ortigo, K. M., Jackson, C., & Koenen, K. C. (2020). *Treating Survivors of Childhood Abuse and Interpersonal Trauma: STAIR Narrative Therapy* (2nd ed..,). Guilford Publications,.

Cloitre, M., Koenen, K. C., Cohen, L. R., & Han, H. (2002). Skills training in affective and interpersonal regulation followed by exposure: a phase-based treatment for PTSD related to childhood abuse. *Journal of Consulting and Clinical Psychology, 70*(5), 1067–1074. https://doi.org/10.1037/0022-006X.70.5.1067

Cloitre, M., Shevlin, M., Brewin, C. R., Bisson, J. I., Roberts, N. P., Maercker, A., Karatzias, T., & Hyland, P. (2018). The International Trauma Questionnaire: development of a self-report measure of ICD-11 PTSD and complex PTSD. *Acta Psychiatrica Scandinavica, 138*(6), 536–546. https://doi.org/10.1111/acps.12956

Cloitre, M., Stovall-McClough, K. C., Miranda, R., & Chemtob, C. M. (2004). Therapeutic alliance, negative mood regulation, and treatment outcome in child abuse-related posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology, 72*(3), 411–416. https://doi.org/10.1037/0022-006X.72.3.411

Cloitre, M., Stovall-McClough, K. C., Nooner, K., Zorbas, P., Cherry, S., Jackson, C. L., Gan, W., & Petkova, E. (2010). Treatment for PTSD related to childhood abuse: a randomized controlled trial. *American Journal of Psychiatry, 167*(8), 915–924. https://doi.org/10.1176/appi.ajp.2010.09081247

Coventry, P. A., Meader, N., Melton, H., Temple, M., Dale, H., Wright, K., Cloitre, M., Karatzias, T., Bisson, J., Roberts, N. P., Brown, J. V. E., Barbui, C., Churchill, R., Lovell, K., McMillan, D., & Gilbody, S. (2020). Psychological and pharmacological interventions for posttraumatic stress disorder and comorbid mental health problems following complex traumatic events: Systematic review and component network meta-analysis. *PLoS Medicine, 17*(8). https://doi.org/10.1371/journal.pmed.1003262

De Jongh, A., Resick, P. A., Zoellner, L. A., Van Minnen, A., Lee, C. W., Monson, C. M., Foa, E. B., Wheeler, K., Broeke, E., ten, Feeny, N., Rauch, S. A. M., Chard, K. M., Mueser, K. T., Sloan, D. M., Van Der Gaag, M., Rothbaum, B. O., Neuner, F., De Roos, C., Hehenkamp, L. M. J., & Bicanic, I. A. E. (2016). Critical analysis of the current treatment guidelines for complex PTSD in adults. *Depression and Anxiety, 33*(5), 359–369. https://doi.org/10.1002/da.22469

Dvir, Y., Ford, J. D., Hill, M., & Frazier, J. A. (2014). Childhood maltreatment, emotional dysregulation, and psychiatric comorbidities. *Harvard Review of Psychiatry, 22*(3), 149–161. https://doi.org/10.1097/HRP.0000000000000014

Ehring, T., Welboren, R., Morina, N., Wicherts, J. M., Freitag, J., & Emmelkamp, P. M. (2014). Meta-analysis of psychological treatments for posttraumatic stress disorder in adult survivors of childhood abuse. *Clinical Psychology Review, 34*(8), 645–657. https://doi.org/10.1016/j.cpr.2014.10.004

Eidhof, M. B., ter Heide, F. J. J., van Der Aa, N., Schreckenbach, M., Schmidt, U., Brand, B. L., Lanius, R. A., Loewenstein, R. J., Spiegel, D., & Vermetten, E. (2019). The Dissociative Subtype of PTSD Interview (DSP-I): Development and Psychometric Properties. *Journal of Trauma and Dissociation, 20*(5), 564–581. https://doi.org/10.1080/15299732.2019.1597806

Foa, E. B., Hembree, E. A., & Rothbaum, B. O. (2007). *Prolonged Exposure Therapy for PTSD: Emotional Processing of Traumatic Experiences: Therapist Guide*. Oxford University Press,. https://doi.org/10.1093/med:psych/9780195308501.001.0001

Foy, D. W., Ruzek, J. I., Glynn, S. M., Riney, S. J., Gusman, F. D., Foy, D., Gusman, F., Marmar, C., Weiss, D., Ruzek, J., Riney, S., Ford, J., Friedman, M., & Schnurr, P. (2002). Trauma focus group therapy for combat-related PTSD: An update. *Journal of Clinical Psychology, 58*(8), 907–918. https://doi.org/10.1002/JCLP.10066

Gerger, H., Munder, T., & Barth, J. (2014). Specific and nonspecific psychological interventions for PTSD symptoms: a meta-analysis with problem complexity as a moderator. *Journal of Clinical Psychology, 70*(7), 601–615. https://doi.org/10.1002/jclp.22059

Goodman, L. A., Corcoran, C., Turner, K., Yuan, N., & Green, B. L. (1998). Assessing traumatic event exposure: general issues and preliminary findings for the Stressful

Life Events Screening Questionnaire. *Journal of Traumatic Stress, 11*(3), 521–542. https://doi.org/10.1023/A:1024456713321

Harned, M. S., Korslund, K. E., Foa, E. B., & Linehan, M. M. (2012). Treating PTSD in Suicidal and Self-injuring Women with Borderline Personality Disorder: Development and Preliminary Evaluation of a Dialectical Behavior Therapy Prolonged Exposure Protocol. *Behav Res Ther, 50*(6), 381–386. https://doi.org/10.1016/j.brat.2012.02.011

Hedges, L. V. (1981). Distribution Theory for Glass's estimator of effect size and related estimators. *Journal of Educational Statistics, 6*(2), 107–128. https://doi.org/10.3102/10769986006002107

Hembree, E. A., & Foa, E. B. (2020). Prolonged exposure therapy. In J. D. Ford, & C. A. Courtois (Eds.), *Treating Complex Traumatic Stress Disorders in Adults: Scientific Foundations and Therapeutic Models, 2nd* (pp. 207–225). The Guilford Press.

Herman, J. L. (1992). *Trauma and Recovery*. Basic Books,.

Herzog, P., & Kaiser, T. (2022). Is it worth it to personalize the treatment of PTSD? – A variance-ratio meta-analysis and estimation of treatment effect heterogeneity in RCTs of PTSD. *Journal of Anxiety Disorders, 91*, Article 102611. https://doi.org/10.1016/j.janxdis.2022.102611

Hoeboer, C. M., Oprel, D. A. C., De Kleine, R. A., Schwartz, B., Deisenhofer, A. K., Schoorl, M., Van Der Does, W. A. J., van Minnen, A., & Lutz, W. (2021). Personalization of Treatment for Patients with Childhood-Abuse-Related Posttraumatic Stress Disorder. *Journal of Clinical Medicine, 10*(19). https://doi.org/10.3390/JCM10194522

Horowitz, L. M., Rosenberg, S. E., Baer, B. A., Ureno, G., & Villasenor, V. S. (1988). Inventory of interpersonal problems: psychometric properties and clinical applications. *Journal of Consulting and Clinical Psychology, 56*, 885–982.

ISTSS, 2018, ISTSS Guidelines Position Paper on Complex PTSD in Adults. ⟨http://www.istss.org/getattachment/Treating-Trauma/New-ISTSS-Prevention-and-Treatment-Guidelines/ISTSS_CPTSD-Position-Paper⟩⟨-(Adults)_FNL.pdf.aspx⟩.

Jackson, C., Weiss, B. J., & Cloitre, M. (2019). STAIR group treatment for veterans with PTSD: efficacy and impact of gender on outcome. *Military Medicine, 184*(1–2), e143–e147. https://doi.org/10.1093/milmed/usy164

Karatzias, T., Murphy, P., Cloitre, M., Bisson, J., Roberts, N., Shevlin, M., Hyland, P., Maercker, A., Ben-Ezra, M., Coventry, P., Mason-Roberts, S., Bradley, A., & Hutton, P. (2019). Psychological interventions for ICD-11 complex PTSD symptoms: Systematic review and meta-analysis. *Psychological Medicine, 49*(11), 1761–1775. https://doi.org/10.1017/S0033291719000436

MacIntosh, H. B., Cloitre, M., Kortis, K., Peck, A., & Weiss, B. J. (2016). Implementation and Evaluation of the Skills Training in Affective and Interpersonal Regulation (STAIR) in a Community Setting in the Context of Childhood Sexual Abuse. *Research on Social Work Practice, 28*(5), 595–602. https://doi.org/10.1177/1049731516656803

Messman-Moore, T. L., & Bhuptani, P. H. (2017). A review of the long-term impact of child maltreatment on posttraumatic stress disorder and its comorbidities: an emotion dysregulation perspective. *Clinical Psychology: Science and Practice, 24*(2), 154–169. https://doi.org/10.1111/cpsp.12193

McLean, C. P., Levy, H. C., Miller, M. L., & Tolin, D. F. (2022). Exposure therapy for PTSD: A meta-analysis. *Clinical Psychology Review, 91*, Article 102115. https://doi.org/10.1016/j.cpr.2021.102115

Monsen, J. T., Hagtvet, K. A., Havik, O. E., & Eilertsen, D. E. (2006). Circumplex structure and personality disorder correlates of the interpersonal problems model (IIP-C): Construct validity and clinical implications. *Psychological Assessment, 18*(2), 165–173. https://doi.org/10.1037/1040-3590.18.2.165

Niwa, M., Kato, T., Narita-Ohtaki, R., Otomo, R., Suga, Y., Sugawara, M., Narita, Z., Hori, H., Kamo, T., & Kim, Y. (2022). Skills Training in Affective and Interpersonal Regulation Narrative Therapy for women with ICD-11 complex PTSD related to childhood abuse in Japan: a pilot study. *European Journal of Psychotraumatology, 13*(1). https://doi.org/10.1080/20008198.2022.2080933

Oprel, D. A. C., Hoeboer, C. M., Schoorl, M., Kleine, R. A. D., Cloitre, M., Wigard, I. G., van Minnen, A., & van der Does, W. (2021). Effect of Prolonged Exposure, intensified Prolonged Exposure and STAIR+Prolonged Exposure in patients with PTSD related to childhood abuse: A randomized controlled trial. *European Journal of Psychotraumatology, 12*(1). https://doi.org/10.1080/20008198.2020.1851511

Raabe, S., Ehring, T., Marquenie, L., Arntz, A., & Kindt, M. (2022). Imagery Rescripting as a stand-alone treatment for posttraumatic stress disorder related to childhood abuse: A randomized controlled trial. *Journal of Behavior Therapy and Experimental Psychiatry, 77*, Article 101769. https://doi.org/10.1016/j.jbtep.2022.101769

Resick, P. A., Bovin, M. J., Calloway, A. L., Dick, A. M., King, M. W., Mitchell, K. S., Suvak, M. K., Wells, S. Y., Stirman, S. W., & Wolf, E. J. (2012). A critical evaluation of the complex PTSD literature: implications for DSM-5. *Journal of Traumatic Stress, 25*(3), 241–251. https://doi.org/10.1002/jts.21699

Resick, P. A., Nishith, P., & Griffin, M. G. (2003). How well does cognitive-behavioral therapy treat symptoms of complex PTSD? An examination of child sexual abuse survivors within a clinical trial. *CNS Spectrums, 8*(5), 340–355. https://doi.org/10.1017/S1092852900018605

Roberts, N., Cloitre, M., Bisson, J.I., & Brewin, C.R., 2016, PTSD & Complex PTSD Diagnostic Interview Schedule for ICD-11 (Test version 2.0).

Sele, P., Hoffart, A., Bækkelund, H., & Øktedalen, T. (2020). Psychometric properties of the International Trauma Questionnaire (ITQ) examined in a Norwegian trauma-exposed clinical sample. *European Journal of Psychotraumatology, 11*(1). https://doi.org/10.1080/20008198.2020.1796187

Sheehan, D., Lecrubier, Y., Harnett-Sheehan, K., Amorim, P. A., Janavs, J., Weiller, E. H. T., Hergueta, T., Baker, R. D. G., & Dunbar, G. C. L. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *The Journal of Clinical Psychiatry, 59 Suppl 20*, 22–33.

Sloan, D. M., Feinstein, B. A., Gallagher, M. W., Beck, J. G., & Keane, T. M. (2013). Efficacy of group treatment for posttraumatic stress disorder symptoms: A meta-analysis. *Psychological Trauma: Theory, Research, Practice, and Policy, 5*(2), 176–183. https://doi.org/10.1037/A0026291

Trappler, B., & Newville, H. (2007). Trauma healing via cognitive behavior therapy in chronically hospitalized patients. *Psychiatric Quarterly, 78*(4), 317–325. https://doi.org/10.1007/s11126-007-9049-8

Van Vliet, N. I., Huntjens, R. J. C., Van Dijk, M. K., Bachrach, N., Meewisse, M.-L., & De Jongh, A. (2021). Phase-based treatment versus immediate trauma-focused treatment for post-traumatic stress disorder due to childhood abuse: randomised clinical trial. *BJPsych Open, 7*(6), Article e211. https://doi.org/10.1192/bjo.2021.1057

Wang, Y.-P., & Gorenstein, C. (2013). Psychometric properties of the Beck Depression Inventory-II: acomprehensive review. *Brazilian Journal of Psychiatry, 35*(4), 416–431. https://doi.org/10.1590/1516-4446-2012-1048

Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2013). *The Clinician-Administered PTSD Scale for DSM-5 (CAPS-5)*. Washington, DC: National Center for PTSD,.

Weathers, F. W., Bovin, M. J., Lee, D. J., Sloan, D. M., Schnurr, P. P., Kaloupek, D. G., Keane, T. M., & Marx, B. P. (2018). The clinician-administered ptsd scale for DSM-5 (CAPS-5): Development and initial psychometric evaluation in military veterans. *Psychological Assessment, 30*(3), 383–395. https://doi.org/10.1037/pas0000486

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). The PTSD Checklist for DSM-5 (PCL-5). *National Center for PTSD, 5*(August), 2002. https://doi.org/10.1037/t02622-000

World Health Organization, 2019, International statistical classification of diseases and related health problems (11th ed.). ⟨https://icd.who.int/⟩.