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Cognitive therapy for PTSD following multiple-trauma exposure in children and adolescents: a case series

Charlotte Smith[1], Catherine E. L. Ford[1], Tim Dalgleish[2], Patrick Smith[3], Anna McKinnon[2], Ben Goodall[2], Isobel Wright[2], Victoria Pile[3] and Richard Meiser-Stedman[1,2]

[1]Department of Clinical Psychology and Psychological Therapies, Norwich Medical School, University of East Anglia, Norwich Research Park, Norwich, UK, [2]MRC Cognition and Brain Sciences Unit, University of Cambridge, Cambridge, UK and [3]Department of Psychology, Institute of Psychiatry, Psychology & Neuroscience, King's College London, Department of Psychology, London, UK
Corresponding author: Richard Meiser-Stedman; Email: r.meiser-stedman@uea.ac.uk

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Abstract

Background: Cognitive therapy for PTSD (CT-PTSD) is an efficacious treatment for children and adolescents with post-traumatic stress disorder (PTSD) following single incident trauma, but there is a lack of evidence relating to this approach for youth with PTSD following exposure to multiple traumatic experiences.
Aims: To assess the safety, acceptability and feasibility of CT-PTSD for youth following multiple trauma, and obtain a preliminary estimate of its pre–post effect size.
Method: Nine children and adolescents (aged 8–17 years) with multiple-trauma PTSD were recruited to a case series of CT-PTSD. Participants completed a structured interview and mental health questionnaires at baseline, post-treatment and 6-month follow-up, and measures of treatment credibility, therapeutic alliance, and mechanisms proposed to underpin treatment response. A developmentally adjusted algorithm for diagnosing PTSD was used.
Results: No safety concerns or adverse effects were recorded. Suicidal ideation reduced following treatment. No participants withdrew from treatment or from the study. CT-PTSD was rated as highly credible. Participants reported strong working alliances with their therapists. Data completion was good at post-treatment ($n = 8$), but modest at 6-month follow-up ($n = 6$). Only two participants met criteria for PTSD (developmentally adjusted algorithm) at post-treatment. A large within-subjects treatment effect was observed post-treatment and at follow up for PTSD severity (using self-report questionnaire measures; $ds > 1.65$) and general functioning (CGAS; $ds < 1.23$). Participants showed reduced anxiety and depression symptoms at post-treatment and follow-up (RCADS-C; $ds > .57$).
Conclusions: These findings suggest that CT-PTSD is a safe, acceptable and feasible treatment for children with multiple-trauma PTSD, which warrants further evaluation.

Keywords: case series; children; CT-PTSD; intervention; PTSD

Introduction

Trauma exposure is common in children and young people (CYP); epidemiological surveys indicate that by the time a child reaches 16 years of age, more than 30% will have been exposed to trauma (Copeland *et al.*, 2007; Lewis *et al.*, 2019; McLaughlin *et al.*, 2013). While for some children this involves a single, isolated traumatic event (e.g. a road traffic collision), a significant proportion

of children experience multiple traumatic events early in life (Doba *et al.*, 2022). This includes children who experience repeated physical, emotional and sexual abuse within the home by a relative. In a recent study by Radford and colleagues (2013), the reported rate of exposure to abuse or neglect in their UK-based sample of 11- to 17-year-olds was 21.9%. Meltzer and colleagues (2009) reported that 4.3% of their UK-based sample of children had been exposed to 'severe' domestic violence. This figure is based on parental reports, however, and may under-estimate the scale of children's exposure. Cohort studies suggest that children with experience of trauma are more likely to have experienced multiple traumas rather than an isolated event (e.g. Doba *et al.*, 2022).

Around 15–25% of children exposed to trauma develop trauma-related symptoms warranting a diagnosis of PTSD (Alisic *et al.*, 2014; Danese *et al.*, 2020). Children who have experienced multiple traumas are at increased risk of PTSD compared with those who have experienced single-incident trauma (Doba *et al.*, 2022; Maercker *et al.*, 2022). They are also more likely to receive a diagnosis of complex PTSD (Hyland *et al.*, 2017). Complex PTSD requires the presence of core PTSD symptoms (i.e. plus three additional symptoms: negative cognitions about the self, interpersonal difficulties, and difficulties with affect regulation; World Health Organisation, 2018). While thought to be associated with more experiences of multiple or repeated trauma, the complex PTSD diagnosis is not specific to this sort of trauma exposure, i.e. complex PTSD can be diagnosed in response to single-event trauma. Some estimates suggest that complex PTSD is a more common presentation than PTSD (Karatzias *et al.*, 2019).

One established psychological treatment for PTSD is trauma-focused cognitive behavioural therapy (TF-CBT). TF-CBT has received worldwide recognition as an effective treatment for adults and children and adolescents with PTSD (Bisson *et al.*, 2019; de Haan *et al.*, 2024). A debate is ongoing around whether TF-CBT is appropriate for complex PTSD, or if a more gradual phase-based approach would be more suitable for this condition (Dyer and Corrigan, 2021). Another treatment that has garnered support for PTSD is eye movement desensitisation and reprocessing (EMDR), which, it has been suggested, may require fewer sessions than TF-CBT to produce a significant improvement in symptoms in CYP (de Roos *et al.*, 2011).

The PRACTICE (Cohen and Mannarino, 2008) protocol is one example of TF-CBT, and to date the most commonly researched protocol for TF-CBT in children and adolescents. Originally developed for children who have been sexually abused, the PRACTICE approach involves guiding children and their families through a phase-based programme (Cohen and Mannarino, 2008). This programme includes psychoeducation, parenting support, relaxation training, affect regulation, exposure, and trauma processing (Cohen and Mannarino, 2008). The treatment combines multiple approaches (e.g. cognitive, behavioural, and systemic) into one treatment plan (de Arellano *et al.*, 2014), and has been shown to be efficacious (Cary and McMillen, 2012).

An alternative approach to treatment is cognitive therapy for PTSD (CT-PTSD; Smith *et al.*, 2010). The cognitive model underpinning this approach proposes that three cognitive processes are responsible for the development and maintenance of PTSD. These are trauma-related cognitive misappraisals; unhelpful cognitive coping strategies such as cognitive and behavioural avoidance, rumination and use of safety-seeking behaviours; and inadequate processing of the trauma memory (Ehlers and Clark, 2000). The strong focus on cognitive aspects of PTSD in CT-PTSD is pertinent, given that researchers are increasingly finding evidence for the crucial role of cognitions in understanding the development and maintenance of this condition (Brown *et al.*, 2019; Gomez de la Cuesta *et al.*, 2019). This research provides strong support for the involvement of each of these three cognitive processes in the development and maintenance of PTSD in children (e.g. Meiser-Stedman *et al.*, 2017; Meiser-Stedman *et al.*, 2019; Woud *et al.*, 2019).

CT-PTSD has several features that lend themselves to working with children and young people with PTSD following multiple trauma exposure. Firstly, it stresses the importance of addressing cognitive processes that have been found to underpin PTSD and complex PTSD symptoms in this population (Hiller *et al.*, 2021; Karatzias *et al.*, 2019; Ponnamperuma and Nicolson, 2015).

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Moreover, CT-PTSD is a formulation-driven approach (Ehlers and Wild, 2015). This means that treatment is tailored to the individual, including the extent to which each cognitive-based factor is contributing towards maintaining their distress (Ehlers *et al.*, 2005). The flexibility of this formulation-driven approach may be particularly beneficial in the treatment of children with more complex PTSD profiles (including those with multiple trauma PTSD) where negative self-concept is considered to be a key factor underpinning dysfunction, and there may be a variety of co-morbid difficulties. CT-PTSD has been used with adults with complex PTSD presentations (for a description, see Ehlers and Murray, 2020; Murray and El-Leithy, 2022), although clinical trials evidence is lacking.

It is possible to treat CYP with single-incident PTSD effectively using CT-PTSD (Hoppen *et al.*, 2023). Whilst there are differences in the presentation of PTSD between CYP with single-incident and multiple traumas (Maercker *et al.*, 2022), it is possible that with adaptations, CT-PTSD could prove an appropriate treatment for CYP with multiple trauma (Smith *et al.*, 2010). At present, however, the feasibility and acceptability of CT-PTSD in this population have not been established. Moreover, there is little evidence concerning how different forms of TF-CBT (including CT-PTSD) might have their beneficial effects in CYP with multiple trauma PTSD; in the case of single-incident trauma, there is evidence that psychological therapy works through shifts in negative trauma-related appraisals (Smith *et al.*, 2007), consistent with the cognitive model of PTSD.

In the present study we aimed to identify whether CT-PTSD is a safe, acceptable and feasible treatment for CYP who have PTSD following multiple-trauma exposure, investigate preliminary clinical outcomes, and explore whether CT-PTSD influences the specific cognitive processes through which it is purported to work. To address these questions, we used a case-series design. This would enable us to determine if a larger scale trial would be warranted and, if so, inform the design of a trial by providing estimated effect sizes, adaptations to the treatment protocol, and acceptable recruitment strategies. We conducted a wide-ranging assessment at each assessment point to index participants' co-morbid difficulties at baseline, consider potential barriers to treatment, and measure potential secondary benefits of treatment. This assessment included global functioning, anxiety and depression, suicidality, emotion regulation and voice hearing (given the emerging evidence linking trauma and auditory hallucinations in youth; Bartels-Velthuis *et al.*, 2012).

Method

Design

A case-series design was used, with outcome measures completed at baseline, post-treatment and 6-month follow-up.

Participants

The study inclusion criteria were: age 8–17 years old who met criteria for a PTSD diagnosis following multiple-trauma exposure. Multiple-trauma exposure was assessed using information provided by the referrer and was confirmed during the parent interview. PTSD diagnosis was confirmed in the study using the Children's PTSD Inventory (CPTSD-I; Saigh *et al.*, 2000). A developmentally adjusted alternative algorithm for diagnosis, derived from *DSM-5* criteria for PTSD, was applied (hereafter PTSD-AA; Meiser-Stedman *et al.*, 2008). This requires the presence of one re-experiencing symptom, one avoidance symptom and two hyper-arousal symptoms, as well as clinically significant distress or impaired functioning. This diagnostic algorithm was used as subsyndromal diagnostic criteria are frequently used in child and adolescent PTSD trials; standard diagnostic criteria (such as *DSM-IV* PTSD) may commonly exclude youth with clinically significant symptoms but do not reach the full diagnostic criteria (e.g. the requirement for three

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avoidance and numbing symptoms in *DSM-IV* PTSD). Multiple trauma exposure was defined in terms of a child experiencing either multiple trauma types, or multiple incidents of a single trauma type (e.g. repeated domestic violence). The exclusion criteria were diagnoses of autism or learning disability, a primary mental health diagnosis other than PTSD, the family of the CYP not speaking English, living in an unsafe environment (e.g. with a known abuser) or brain damage.

Procedure

Recruitment was supported by healthcare professionals in two child and adolescent mental health teams and one specialist service situated across two mental health NHS Trusts. Healthcare professionals identified potential participants within their services, introduced them to the study and sought consent for their details to be passed to the research team. Those who consented for their details to be shared were sent an information sheet and contacted by the research team for eligibility screening and if eligible, to arrange an assessment meeting. Written consent was obtained from parents and assent was obtained from the CYP during this first face-to-face meeting. Participant PTSD diagnosis was reconfirmed at this stage, applying a developmentally adjusted algorithm (PTSD-AA; i.e. at least one re-experiencing symptom, at least one avoidance symptom, at least two hyper-arousal symptoms, and impaired functioning, using symptoms from the *DSM-IV* PTSD diagnosis; Meiser-Stedman *et al.*, 2008).

Intervention

CT-PTSD was delivered by three clinical psychologists (study authors) who have specialist training in the treatment of child PTSD. They received regular supervision throughout the treatment phase by a clinical psychologist who adapted CT-PTSD for use with children and adolescents (P.S.). Details of this intervention can be found elsewhere (Smith *et al.*, 2010). Treatment was delivered in an individual format (i.e. one therapist with one CYP) in up to 15 weekly sessions, more than the original 10-session treatment package for single event trauma (Meiser-Stedman *et al.*, 2017; Smith *et al.*, 2007). These additional sessions were to allow for some focused stabilisation work if required, the production of a timeline, and work on multiple trauma memories (using narrative or imaginal reliving techniques); for more details see below. Parents joined sessions on an *ad hoc* basis or at the end of a session to provide an update of the progress made that session but were not included routinely in the main work of each session. Treatment ceased once the clinician and young person agreed that PTSD symptoms had reduced sufficiently.

Specific therapy techniques in CT-PTSD include psychoeducation about PTSD and its treatment, reclaiming life (behavioural activation), the development of coherent trauma narratives, the identification and reappraisal of unhelpful trauma-related beliefs, the incorporation of new corrective information into trauma memories, reduction in the use of maladaptive behaviours (e.g. safety behaviours, rumination), working with trauma-related triggers, safety planning and development of a therapy blueprint. Imaginal reliving was used to a limited extent, and only after written narrative work had been concluded, to help fully consolidate corrective information into trauma memories. The CT-PTSD manual provides some guidance on adaptations to treat CYP with multiple trauma PTSD (Smith *et al.*, 2010). Several of these adaptations were applied in the current study. Firstly, treatment duration was lengthened because multiple trauma memories were present, as noted above. Secondly, clinicians worked collaboratively with each CYP to plan the order in which the traumatic memories would be processed, supported by the development of a timeline at the beginning of therapy. Thirdly, attention was given to elaborating the CYP's timeline, to help understand the social and academic context in which traumas occurred (e.g. what important relationships were involved in the traumas, to what extent the child's school or family supported them once the trauma was disclosed) and looking towards their future identity formation (e.g. what are their plans for their

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life, what kind of person do they wish to be). Fourthly, a period of stabilisation was provided, if needed. This provided the CYP and clinician with an opportunity to address any pressing, acute issues (e.g. self-harm, very low mood) before beginning trauma processing. Rather than provide a formal, multi-session and generic skills-focused stabilisation phase to all participants, as proposed in other phase-based PTSD treatments (Dyer and Corrigan, 2021), we offered stabilisation that was tailored to the individual's presenting difficulties (e.g. a focus on behavioural activation if suffering from low mood, anger management or other emotion regulation skills), if indeed it was required at all.

Measures

Data were collected from parents on their child's sociodemographic background and trauma history. A series of questionnaires were completed by CYP at baseline, post-treatment and at 6-month follow-up. Treatment outcomes were assessed using PTSD-specific and broader, non-PTSD-related mental health measures. Scoring and psychometric properties of each of the questionnaires used in this study are provided in Table S1 of the Supplementary material.

Safety, feasibility, and acceptability of CT-PTSD

The safety of CT-PTSD was assessed by monitoring serious adverse events, symptom exacerbation, and level of suicidality across the study. To assess suicidality, participants were asked to complete the suicidal ideation subscale of the Mood and Feelings Questionnaire (MFQ-SI; Hammerton *et al.*, 2014). This self-report measure was administered at baseline, after treatment and at 6-month follow-up. In order to reduce participant burden, these items were added to the end of the child-completed Revised Child Anxiety and Depression Scale (RCADS; see below); as such these items were score on a 0–3 scale, rather than a 0–2 scale as in the original MFQ.

Feasibility was assessed in terms of the ability to meet the recruitment target (8–12 CYP). Data were collected on the recruitment process, recruitment timeline, referral routes and reasons for exclusion and drop-out (if applicable). The acceptability of the intervention was assessed via reported credibility ratings of treatment (using a 4-item questionnaire taken from Ehlers *et al.*, 2003), a measure of therapeutic alliance (the short-form of the Working Alliance Inventory: WAI-S; Tracey and Kokotovic, 1989), and treatment discontinuation.

Mental health outcomes: PTSD

DSM-IV PTSD and PTSD-AA diagnoses were assessed using the CPTSD-I (Saigh *et al.*, 2000). This structured interview was administered by a member of the research team at baseline, post-treatment and 6-month follow-up.

PTSD symptom count and severity were assessed at baseline, post-treatment and 6-month follow-up using the CRIES (the 13-item version, with data for the abbreviated 8-item version also reported; Perrin *et al.*, 2005) and Child PTSD Symptom Scale (CPSS, a measure of *DSM-IV* PTSD symptoms; Foa *et al.*, 2001). The CRIES-8 is the routine outcome measure for PTSD in the UK (Wolpert *et al.*, 2016)

Mental health outcomes: other psychopathology

The extent to which the sample experienced difficulties in emotion regulation, which is a main feature of complex PTSD, was also assessed using the Difficulties in Emotion Regulation Scale (DERS-child version; Gratz and Roemer, 2004). The DERS provides scores for six domains of emotion regulation: (i) non-acceptance of emotional responses, (ii) difficulty engaging in goal-directed behaviour,

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(iii) impulse control difficulties, (iv) lack of emotional awareness, (v) limited access to emotion regulation strategies and (vi) lack of emotional clarity.

The general mental health status and overall functioning of participants were assessed using the (child-completed) Revised Child Anxiety and Depression Scale (RCADS; Chorpita *et al.*, 2005) and Children's Global Assessment Scale (CGAS; Shaffer *et al.*, 1983), respectively. The RCADS provides scores on six subscales: social anxiety, panic, depression, separation anxiety, generalised anxiety, and obsessions and compulsions. The CGAS is completed by the researcher and provides an overall functional score.

Voice hearing was also assessed, using items from the Voice Hearing Questionnaire (Anilmis *et al.*, 2015), given the emerging evidence linking trauma and auditory hallucinations in youth (Bartels-Velthuis *et al.*, 2012).

Cognitive processes

Seven potential cognitive and psychosocial mechanisms of treatment were assessed pre- and post-treatment using a range of child self-report questionnaires. These questionnaires assessed: trauma-related appraisals (Child Post-Traumatic Cognitions Inventory (CPTCI); Meiser-Stedman *et al.*, 2009), trauma-related memory quality (Trauma Memory Quality Questionnaire (TMQQ); Meiser-Stedman *et al.*, 2007), perceived social support (Multidimensional Scale of Perceived Social Support (MSPSS); Zimet *et al.*, 1988), the use of safety behaviours (Child Safety Behaviour Scale (CSBS); Alberici *et al.*, 2018), self-blame, trauma-related rumination, and trauma-related thought suppression. The latter three were assessed using a questionnaire developed for use in a previous randomised controlled trial (RCT) (Meiser-Stedman *et al.*, 2017).

Analysis

Analysis involved descriptive statistics and visual analytic methods consistent with other intervention case series (Brand *et al.*, 2020; Maddox *et al.*, 2013). Within-subjects effect sizes were calculated for pre/post and pre/6-month changes independently using SPSS. The adjusted (Hedges' *g*) effect size statistic was used as a conservative option that takes account of the small sample size. For the CRIES-8 and the RCADS, reliable improvement (and reliable deterioration) was assessed using published reliable change index scores (Wolpert *et al.*, 2016).

Results

Recruitment and retention

Recruitment took place over a 5-month period, between January and July 2014. A CONSORT diagram of the recruitment and study process is provided in Fig. 1. All participants who consented to the study completed treatment. The mean number of therapy sessions required for participants was 11.2 ($SD = 1.3$; range 9–13). Treatment ceased once the clinician and young person agreed that PTSD symptoms had abated sufficiently.

Sample characteristics and trauma history

Nine young people were recruited aged between 9.5 and 17.0 years (mean = 14.1, $SD = 3.2$); seven were female. One participant identified as belonging to a minoritised racial group. Three participants had parents who were married; in three cases their parents were cohabiting; one participant lived with a separated/divorced parent; one participant lived with a single parent; in one case these data were not available. Household incomes were as follows: less than £10,000 per

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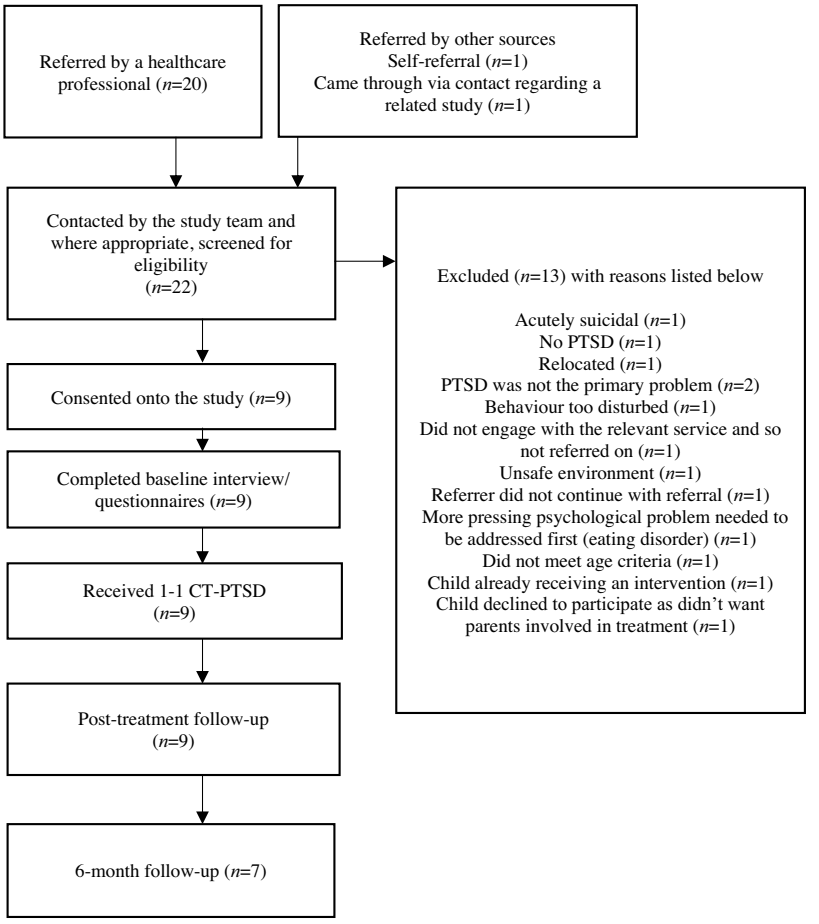

Figure 1. A CONSORT diagram of the recruitment and study process.

year, $n = 1$; £10,000–20,000, $n = 1$; £20,000–30,000, $n = 2$; £30,000–40,000, $n = 2$; missing, $n = 3$.

The participants had experienced a mean of 2.0 ($SD = 1.5$) different types of trauma (range 1–4). The most common type of trauma experienced by the sample was domestic violence within the home environment ($n = 5$) followed by sexual assault/abuse ($n = 4$) and road traffic accidents ($n = 3$). Other traumas experienced were attempted murder ($n = 1$), physical assaults in the context of bullying ($n = 1$), witnessing the near death of a relative ($n = 1$), torture ($n = 1$), being accused of a serious criminal act ($n = 1$), and physical abuse ($n = 1$).

Voice hearing at baseline

At baseline, six out of the eight participants for whom there were data, reported hearing voices. Three of these reported hearing the voices of people who attacked them, and voices that were part of their intrusive thoughts or flashbacks. The other three children reported that their voices involved neither of these. Of this group of voice hearers, only one reported hearing voices in the previous 2 weeks ($n = 5$ due to one missing data point).

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Safety

No adverse events were recorded throughout the study. No evidence of PTSD symptom exacerbation was found at post-treatment. At no point did treatment have to be discontinued for any participant.

The overall mean score for the four suicidal ideation items (drawn from the MFQ) was 4.13 ($n = 8$; possible range 0–12) at baseline, 1.25 ($n = 8$) at post-treatment and 1.33 ($n = 6$) at 6-month follow-up; i.e. suicidality was not especially present in this sample, but it nevertheless improved and stayed low at follow-up. Full descriptive statistics and effect sizes for participant suicidal ideation score across the study are provided in Table 1; a medium pre–post effect size for suicidal ideation was found.

Acceptability: treatment credibility and therapeutic alliance

The mean score for treatment credibility across all four items at post-treatment was 8.9 (maximum score 10, $n = 8$; range 4.8–10.0). Four of the eight children for whom we had data on this measure gave a score of 10 for every credibility item. The mean score for therapeutic alliance at post-treatment was 6.2 (maximum possible 7; $n = 6$, range 5.8–7.0).

PTSD caseness post-treatment

PTSD caseness was assessed at baseline and post-treatment according to *DSM-IV* criteria and the developmentally adjusted algorithm for PTSD (PTSD-AA; Meiser-Stedman *et al.*, 2008). At baseline, all nine participants met the PTSD-AA criteria, and seven also met full *DSM-IV* criteria for PTSD (see Table S2 in the Supplementary material for individual caseness data). At post-treatment, all nine participants completed the structured interview for PTSD; one participant met *DSM-IV* criteria for PTSD, and two participants met PTSD-AA criteria (i.e. one participant met criteria for both *DSM-IV* PTSD and PTSD-AA). At 6-month follow-up, one of the seven participants for whom there are data met the *DSM-IV* or PTSD-AA criteria.

PTSD severity

A large pre–post effect size was observed for PTSD severity using the CPSS and the CRIES (both the CRIES-8 and CRIES-13) at post-treatment and 6-month follow-up (see Table 1). At post-treatment all eight children for whom there were data demonstrated reliable clinical change on the CRIES-8. At 6-month follow-up, five children (of six with available data) demonstrated reliable improvement on the CRIES-8 (see Table S3 in the Supplementary material for reliable change data on the CRIES-8, and Table S4 for individual scores on each severity measure).

Session-by-session mean total CPSS scores are presented in Fig. 2. Across the intervention phase, PTSD severity reduced markedly. There were no apparent increases in severity at any point during treatment. PTSD severity reduced at a steady pace until session 7, when scores plateaued. Session-by-session mean impairment scores (CPSS) are presented in Fig. 3. PTSD-related level of impairment can be clearly seen to reduce throughout intervention, with the biggest treatment gains occurring soon after treatment commenced (weeks 1–3). There is a slight increase in impairment between weeks 3 and 4 of treatment, which does not reach baseline level, and reduces in subsequent sessions.

General functioning

A large effect size was observed for overall functioning of the sample (CGAS) at post-treatment and 6-month follow-up (see Table 1).

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Table 1. Mean, standard deviations and effect sizes for quantitative measures

	Baseline			Post-treatment			6-month follow-up			Hedges' *g*, baseline–post	Hedges' *g*, baseline–6–month follow-up
Outcome	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*g* (95% CI; *n*)	*g* (95% CI; *n*)
PTSD severity											
CPSS (*DSM-IV* PTSD)	22.00	11.96	9	3.56	5.90	9	4.29	4.11	7	1.98 (.85, 3.09; 9)	4.08 (1.75, 6.41; 7)
CRIES-13	45.75	10.59	8	5.25	7.07	8	11.14	11.13	7	4.25 (1.99, 6.50; 8)	1.65 (.43, 2.83; 6)
CRIES-8	28.75	7.32	8	1.75	2.55	8	4.43	7.25	7	2.99 (1.33, 4.63; 8)	1.82 (.52, 3.09; 6)
General functioning (CGAS)	57.00	10.78	8	76.78	14.58	9	78.86	13.93	7	−1.23 (−2.10, −.33; 8)	−1.41 (−2.40, −.38; 7)
Suicidality (MFQ-SI)	4.13	4.39	8	1.25	1.75	8	1.33	3.27	6	.59 (−.11, 1.26; 8)	.35 (−.37, 1.03; 6)
Anxiety and depression (RCADS-C)											
Social phobia	14.50	7.84	8	4.88	5.94	8	6.00	4.34	6	1.07 (.23, 1.88; 8)	.77 (−.07, 1.56; 6)
Panic	11.25	7.82	8	4.38	6.37	8	4.00	4.82	6	1.32 (.38, 2.21; 8)	.57 (−.21, 1.31; 6)
Depression	16.00	8.30	8	3.93	4.84	8	5.67	6.56	6	1.42 (.45, 2.35; 8)	.87 (−.01, 1.70; 6)
Obsessions and compulsions	7.75	4.33	8	2.00	2.45	8	1.83	2.14	6	1.43 (.45, 2.37; 8)	1.00 (.07, 1.87; 6)
Generalised anxiety	9.25	6.56	8	2.50	3.96	8	3.33	2.34	6	1.14 (.27, 1.97; 8)	.70 (−.12, 1.47; 6)
Separation anxiety	7.63	5.13	8	2.75	4.30	8	3.00	2.83	6	.95 (.14, 1.71; 8)	.66 (−.15, 1.42; 6)
Difficulties in Emotion Regulation Scale (DERS)											
Non-acceptance of emotional responses	14.00	8.09	8	9.25	5.23	8	—	—	—	.44 (−.23, 1.08; 8)	—
Difficulty engaging in goal directed behaviour	19.50	3.42	8	12.00	5.45	8	—	—	—	.92 (.12, 1.67; 8)	—
Impulse control difficulties	18.88	6.88	8	11.88	5.22	8	—	—	—	.81 (.05, 1.53; 8)	—
Lack of emotional awareness	19.25	6.76	8	21.50	6.85	8	—	—	—	−.19 (−.81, .44; 8)	—
Limited access to emotion regulation strategies	25.00	5.45	8	14.75	7.42	8	—	—	—	1.02 (.19, 1.81; 8)	—
Lack of emotional clarity	16.00	3.25	8	11.25	5.09	8	—	—	—	.66 (−.06, 1.35; 8)	—

CGAS, Children's Global Assessment Scale; CPSS, Child PTSD Symptom Scale; CRIES, Child Revised Impact of Events Scale; DERS, Difficulties in Emotion Regulation Scale; MFQ, Mood and Feelings Questionnaire, suicidal ideation subscale; N/A, not applicable; RCADS-C, Revised Child Anxiety and Depression Scale (child administered version).

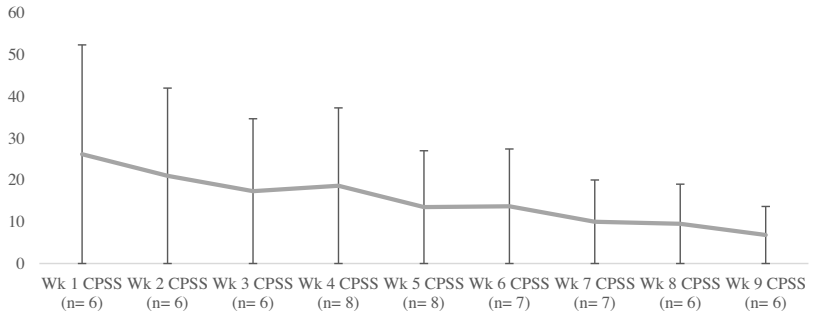

Figure 2. Mean total score on the CPSS by session. Error bars indicate 95% confidence intervals. Case 6 was removed as there were no session-by-session data available for this participant.

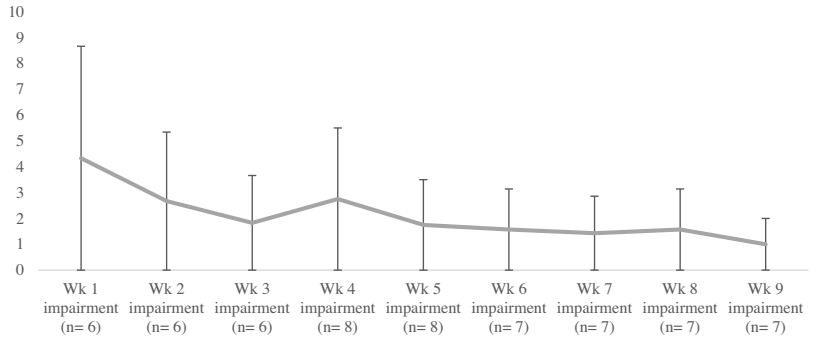

Figure 3. Mean total impairment score on the CPSS by session. Error bars indicate 95% confidence intervals. Case 6 was removed as there were no session-by-session data available for this participant.

Anxiety and depression

As shown in Table 1, large baseline to post-treatment effect sizes were observed for all anxiety subscales and depression (as assessed with the child-reported RCADS). Medium to large effect sizes were observed for anxiety and depression at 6-month follow-up.

The extent to which reliable improvement was demonstrated at post-treatment and 6-month follow-up varied by subscale (see Table S3). All eight participants for whom there were data demonstrated reliable improvement post-treatment on the obsessions and compulsions and panic disorder subscales. The percentage of participants demonstrating reliable improvement on other post-treatment subscales varied between 25 and 75%. At 6-month follow-up, half of the participants demonstrated reliable improvement on five of the six subscales. The lowest frequency of reliable improvement was observed for the separation anxiety subscale, where only 25% of the sample demonstrated reliable improvement. However, this increased to 50% of the sample at 6-month follow-up; it is also noteworthy that separation anxiety was not very high at baseline, making it hard to demonstrate reliable improvement.

Table S5 in the Supplementary material presents case-by-case data for scoring above clinical cut off (T>70) for the six subscales of the RCADS-C at baseline, post-intervention and 6-month follow-up. Seven of eight cases scored above cut-off at baseline for at least one subscale, but these elevated scores persisted at post-treatment for only one participant. At 6-month follow-up, only case 1 met the clinical cut-off for the difficulty they had initially presented with. Panic was the most common subscale where participants scored above cut-off at baseline ($n = 5$), followed by depression ($n = 3$) and separation anxiety ($n = 3$).

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Table 2. Means, standard deviations, mean differences and effect sizes for each cognitive or psychological mechanism assessed

	Baseline			Post-intervention			
Cognitive or psychosocial mechanism	*M*	*SD*	*N*	*M*	*SD*	*N*	Hedges' *g* (95% CI; *n*)
Trauma-related misappraisals (CPTCI)	63.94	24.40	9	31.75	12.78	8	1.39 (.43, 2.32; 8)
Memory quality (TMQQ)	30.99	6.48	9	16.50	6.57	8	1.70 (.62, 2.75; 8)
Rumination	9.22	3.03	9	5.13	3.68	8	.90 (.11, 1.65; 8)
Safety behaviours (CSBS)	34.67	17.69	9	9.16	13.15	8	1.72 (.63, 2.77; 8)
Self-blame	4.22	2.54	9	2.13	.35	8	.68 (–.05, 1.37; 8)
Thought suppression	16.00	3.46	9	6.38	3.89	8	1.40 (.43, 2.32; 8)
Social support (MSPSS)	60.10	18.83	9	66.50	16.65	8	–.34 (–.97, .31; 8)

CPTCI, Children's Posttraumatic Cognitions Inventory; CSBS, Child Safety Behaviour Scale; MPSS, Multidimensional Scale of Perceived Social Support; TMQQ, Trauma Memory Quality Questionnaire.

Difficulties with affect regulation

As shown in Table 1, a large effect size was observed post-treatment for the DERS subscales of 'difficulty engaging in directed behaviour', 'impulse control difficulties' and 'limited access to emotion regulation strategies'. A medium–large effect size was observed for the 'lack of emotional clarity' subscale. A small–medium effect size was observed for the 'non-acceptance of emotional responses' subscale.

Putative cognitive treatment mechanisms

Table 2 provides effect size findings for each cognitive process through which CT-PTSD is purported to work. Large effect sizes were observed for all cognitive factors assessed, with the exception of self-blame and perceived social support which yielded medium and small effect sizes, respectively.

Discussion

This case series is the first investigation of the suitability of CT-PTSD for CYP with diagnosed PTSD following exposure to multiple trauma. The results suggest that CT-PTSD is a safe, acceptable and feasible treatment for this subgroup. Participants regarded CT-PTSD as a highly credible form of treatment and reported experiencing a strong working alliance with clinicians. As treatment requires children to engage directly and intensively with numerous distressing memories, it is encouraging that strong working alliances were maintained throughout. Notably, all nine participants engaged with treatment, with no participants withdrawing from treatment.

In terms of the safety of CT-PTSD, it was found that children with multiple-trauma PTSD tolerated the treatment well. No adverse events were reported throughout the duration of the study and treatment did not have to be discontinued for any reason. There was no evidence of PTSD symptom exacerbation. Findings showed that level of risk, as indicated by a measure of suicidal ideation, reduced during treatment; it is important to note, however, that suicidality was not at a high level at baseline.

The preliminary treatment outcomes are encouraging. All nine young people demonstrated improvements in PTSD symptoms, overall functioning, and improvements in anxiety and depression were common. With respect to PTSD caseness, our findings showed treatment benefit for all but two participants. In line with this, PTSD severity and symptom count decreased post-treatment, and scores for both remained low at 6-month follow-up, with large treatment effect sizes observed. The study design utilised here clearly does not control for other potential explanations for the observed pattern of results, e.g. demand characteristic response bias, reversion to the mean. This preliminary evidence suggests that CT-PTSD for children with multiple-trauma PTSD warrants full

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investigation in an RCT. The large within-subjects (i.e. pre–post and pre–6 months follow-up) effect sizes observed for PTSD severity and symptom count are similar to those reported for single-incident PTSD (Meiser-Stedman *et al.*, 2017). Moreover, significant treatment gains were obtained within an average of only 11 sessions despite a history of exposure to multiple, severe traumas, and without the use of a lengthy stabilisation phase for all participants.

We observed a large shift in the core cognitive mechanisms through which treatment is purported to work. This is consistent with the proposal that successful treatment involves addressing the cognitive-specific mechanisms implicated in the cognitive model of PTSD (Ehlers and Clark, 2000). Specifically, large treatment effect sizes were found for trauma-related misappraisals, trauma memory quality, rumination, safety behaviours and thought suppression, all of which reduced following treatment. This replicates findings from research on single-incident PTSD (Meiser-Stedman *et al.*, 2017; Smith *et al.*, 2007). Overall, this suggests that CT-PTSD may be a suitable treatment approach for this group, as the same mechanisms can be targeted in both single- and multiple-incident PTSD with some modest adaptations (i.e. more sessions, use of a timeline, more sessions for memory work) and limited, needs-based use of stabilisation techniques.

Limitations

The primary limitation of this research is the size of the sample. Nine participants is consistent with previous case series research and considered sufficient for this study design. A review of 586 case series studies reported that 63% of these had equal or fewer than 10 participants (Abu-Zidan *et al.*, 2012). Similar intervention case series in clinical psychology research have recruited between four and 15 participants (e.g. Glover *et al.*, 2007; Maddox *et al.*, 2013). This study provides a 'proof of concept' for CT-PTSD in children exposed to multiple trauma. However, it will be important for research to progress to full randomised controlled trials of CT-PTSD in this population, to test efficacy.

It is important to acknowledge that the findings are based on an unrepresentative sample; participants in this UK study were predominantly white, adolescent females. This sample bias is not unique to this study, with many studies finding this trend in their research on trauma therapy (e.g. Martin *et al.*, 2013). Over three-quarters of the present sample were female, and some evidence suggests that PTSD treatment is more successful for females (Stefanovic and Rosenheck, 2020) so gender may have led to an over-inflation of treatment effect size. In addition, the youngest child to take part in this study was 9.5 years old, so it remains unclear whether this treatment is acceptable to younger children.

The findings predominantly rely on self-report measures completed by CYP. This was considered appropriate based on research suggesting that children's self-reports of their PTSD symptoms are more accurate than reports provided by their parents, and that parental report of a child's PTSD symptoms is impacted by their own PTSD-related pathology (Shemesh *et al.*, 2005). Moreover, CT-PTSD was delivered by clinical psychologists with extensive training and supervision in this model, i.e. this was a research clinic setting rather than routine clinical practice, limiting the generalisability of the findings. Treatment fidelity was not formally checked, e.g. with therapy sessions rated by another qualified therapist. The number of sessions required for treatment (mean 11 sessions) was only a few more than previous studies of PTSD following single-event trauma (Meiser-Stedman *et al.*, 2017; Smith *et al.*, 2007). This is a striking finding, as this number is much less than the maximum of 15 sessions we had originally envisaged, and the suggestion of more than 12 sessions given by NICE (2018).

When data were collected for this case series the diagnostic criteria for ICD-11 complex PTSD had not been published. While our findings are encouraging in terms of affect regulation changes, data on this novel diagnosis in CYP are urgently needed. Moreover, there were no validated measures for *DSM-5* PTSD symptoms in CYP when this study was devised, limiting the relevance of our findings for current conceptualisations of PTSD.

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Future research

The findings provide a strong argument for the feasibility, necessity and appropriateness of conducting a randomised controlled trial of the efficacy of CT-PTSD in children with multi-trauma PTSD. The findings of this feasibility case-series would inform the development of such a trial. The minimal use of stabilisation here suggests that a phase-based approached, with a strong emphasis on stabilisation at the beginning of therapy, is not essential for working with CYP with PTSD in response to multiple trauma exposure. They suggest that within the UK this subgroup is relatively easy to recruit to research trials and a timescale of recruiting one person per month is feasible. Recruiting via local NHS mental health Trusts appears feasible. As our sample was skewed towards white female adolescents, it is worth considering how a more representative, culturally diverse sample could be reached in a full trial. It is also worth considering the option of mental health professionals other than clinical psychologists delivering CT-PTSD within a full trial. A systematic review has shown that the delivery of TF-CBT by other therapy professionals does not necessarily compromise on outcome (Grainger *et al.*, 2022) and this will have clear economic impacts. Our case series provides effect sizes that can inform power calculations for intervention trials. As all participants of this case series tolerated treatment well and demonstrated good treatment outcomes, the minor adaptations made to the CT-PTSD appear feasible, appropriate and sufficient for use in a full efficacy trial.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S1352465824000444

Data availability statement. The data for this study are available from Richard Meiser-Stedman.

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