

RESEARCH ARTICLE

‘School-based screen-and-treat’: An effective blueprint for expediting access to care in children experiencing PTSD following disasters

Vanessa E. Cobham¹  | Brett McDermott² ¹School of Psychology, The University of Queensland, Brisbane, Queensland, Australia²Centre for Mental Health Service Innovation, University of Tasmania, Hobart, Tasmania, Australia**Correspondence**

Vanessa E. Cobham, School of Psychology, The University of Queensland, Brisbane, QLD, Australia.

Email: vanessa@psy.uq.edu.au**Abstract**

Objectives: While 5%–10% of children exposed to natural disasters develop PTSD, few children access support. This paper reports on the proactive ‘screen-and-treat’ approach deployed following devastating floods in Queensland, Australia, in 2011 and presents results for children in the Lockyer Valley (the most impacted community).

Design: Open treatment study (2011–2012) within a government-funded post-disaster service response.

Methods: One hundred and fifty children (7–12 years) completed pencil-and-paper screening (PTSD, anxiety and depression) at school. Eighty children endorsing either clinical levels of PTSD, or moderate levels of PTSD and clinical levels of either anxiety or depression, and their parents, completed a structured diagnostic interview. Forty-eight children were offered a free trauma-focused CBT intervention. The parents of 19 children accepted this offer. Most clinicians were clinical psychology trainees from local universities. All measures were repeated at post-treatment, 6- and 12-month follow-up. Note: The term ‘parents’ is used to refer to the wide variety of people serving as a child’s primary caregiver.

Results: Pre-treatment, all children met diagnostic criteria for full ($N = 17$) or sub-clinical PTSD. By post-treatment, 10.5% met criteria for PTSD, with 0% meeting criteria at the 12-month follow-up. The incidence of anxiety and depressive disorders also reduced significantly. There were no differences in outcomes for children seen by trainees compared to experienced clinicians.

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Conclusions: A school-based screen-and-treat approach offers potential as a means of identifying and treating children following natural disaster exposure. However, engagement of families at the outset, and when offering intervention was challenging. Postgraduate trainees represent an effective potential workforce in a post-disaster environment.

KEY WORDS

access, children, natural disaster, posttraumatic stress, PTSD, screen-and-treat, TF-CBT

Practitioner points

- A proactive, 2-stage school-based screening process was an effective means of identifying consented children with PTSD and other posttraumatic mental health problems following a natural disaster. Notably, uptake of screening sat at <50%.
- Clinical psychology trainees were a viable, acceptable and highly effective clinical workforce in this post-disaster setting.
- The trauma-focused, manualized CBT intervention used was effective in significantly reducing symptoms of not just PTSD but also anxiety and depression. The biggest improvements came from before to immediately after treatment, but these were sustained over time, with 100%, 76.5% and 100% of children being free of the diagnoses of PTSD, anxiety and depressive disorders, respectively, at the 12-month follow-up.
- Despite the provision of psychoeducation about both the intervention and the implications of not accepting treatment, a high proportion of families (>60%) who were offered treatment declined it.

INTRODUCTION

The frequency and severity of climate-related disasters continue to increase (UNICEF, 2021), with recent figures estimating that, worldwide, 11% of children have been exposed to a natural disaster before the age of 16 (Cadamuro et al., 2021). Children represent a uniquely vulnerable group (Danese et al., 2020). Compared to adults, children have less well-developed cognitive processing and emotion regulation skills. The community-wide impact of natural disasters also means that, in addition to their individual potentially traumatic experiences, children may experience significant disruption to and/or loss of pre-disaster supports. Thus, the capacity of key adults (particularly parents), friends and peers; as well as social infrastructure (e.g., schools), to support children's physical and emotional needs, may be significantly compromised.

Posttraumatic stress symptoms (PTSS – often conceptualized as subclinical PTSD), and diagnosable PTSD are the most common psychological presentations experienced by children following trauma exposure (Scheeringa & Zeanah, 2008), including natural disaster exposure specifically (Le Roux & Cobham, 2022). Prevalence rates for PTSS among children exposed to natural disasters range from 30%–70%, while 5%–10% meet criteria for a full PTSD diagnosis (e.g., Bokszczanin, 2007; Kucukoglu et al., 2015; Ma et al., 2011). Without intervention, for many, the symptoms are long-lasting, with a recent review noting that, across studies of children exposed to natural disasters, 3.9%–38% were categorized as falling into the chronic trajectory group (Lai et al., 2017). In making sense of this wide range,

it is important to note that, reflecting the nature of research in this field, the timing of both first and final assessments in the studies reviewed by Lai and colleagues varied markedly, with first assessments occurring from 12-months pre-disaster to 24-months post-disaster and final assessments occurring from 1-month post-disaster to 49-months post-disaster. Most studies have focused on PTSS and PTSD; however, other mental health problems such as anxiety and depression also appear to be common consequences of natural disaster (e.g., Lai et al., 2017). Consistent with their place as the core psychological injury, PTSS and PTSD in children are associated with increased risk for other problems, including anxiety disorders, sleep disturbances, substance abuse, depression, suicidal ideation and disruptive behaviour (Cheng et al., 2020; Lai et al., 2020). Importantly, PTSD appears to represent an efficient core treatment target, with anxiety, depression and disruptive behaviour symptoms in children all found to improve when PTSD is the focus of treatment (Kowalik et al., 2011).

In considering feasible, evidence-based post-disaster mental health interventions, an understanding of the key challenges relating to treatment access in a post-disaster environment is necessary. It is widely recognized that mental health service provision post-disaster is best considered within the framework of a stepped model of care that incorporates universal through to more targeted intervention strategies (e.g., McDermott & Cobham, 2014; National Emergency Management Agency, 2023; NATO Joint Medical Committee, 2008). In such a model, (1) there is recognition that most people will not develop ongoing PTSD or other new mental health problems; and (2) the specialization and intensity of care increase to meet need, such that ideally people receive the care they require – no more and no less. However (and highlighting a critical access challenge), children in need are rarely presented for mental health support (Scheeringa et al., 2014). This means that a proactive approach to assessment and treatment is required (Danese et al., 2020; McDermott & Cobham, 2014). Screening in disaster-affected areas (DAAs) has the potential to be a highly efficient and proactive means of identifying children experiencing post-disaster mental health problems (McDermott & Cobham, 2014; Scheeringa et al., 2014); although, importantly, little is known about families' uptake of post-disaster screening. A recent systematic review noted that school-based screening appears to be the most efficient means of identifying children in need post-disaster (Galvan et al., 2021). Schools are a logical location in which to conduct screening and treatment, offering, as they do, minimal barriers for families (Trentini et al., 2018). In the current study, a school-based 'screen-and-treat' approach was adopted to meet the needs of children requiring the most intense level of care, namely children who met criteria for PTSD or PTSS plus either an anxiety or depressive disorder 4 months after the disaster.

This highlights a second key access challenge: workforce. Even if only a modest proportion of the children who developed PTSS and PTSD following natural disaster exposure were presented for treatment, existing clinical services would be overwhelmed (Scheeringa et al., 2014). The issue of the workforce is a massive barrier to care in a post-disaster environment and means it is impossible to mount an adequate post-disaster mental health response without new funding (Scheeringa et al., 2014). However, even when funding is made available, workforce – particularly at the 'pointy' or tertiary end of the stepped care model – represents a significant challenge. One potential solution is to employ postgraduate students from appropriate, accredited training programmes (e.g., clinical psychology) as clinicians in the post-disaster setting. Advantages of this group include: a generally standardized and high level of training; familiarity with both manualized, evidence-based interventions and regular supervision; and more flexible timetables. In the current study, the challenge of the workforce (in the context of a government-funded post-disaster mental health response) was met by employing postgraduate clinical psychology trainees from local universities.

To date, the psychological intervention that has the strongest evidence in the treatment of youth exposed to any type of potentially traumatic event is Trauma-focused Cognitive Behavioural Therapy or TF-CBT (e.g., National Institute for Health and Care Excellence, 2018; Phoenix Australia, 2020). However, in the field of natural disaster-related trauma exposure, relatively few published studies examining the treatment of children's PTSD exist. A comprehensive review is beyond the scope of this paper. The interested reader is referred to Le Roux and Cobham (2022). The key findings of this review are briefly summarized here. Fifteen studies evaluating interventions for PTSD in children following

natural disaster exposure were identified ($N=1337$ children). Of studies reporting a specific treatment approach, the majority ($N=6$) used TF-CBT. Only two studies took a multi-informant (children and parents) and multi-method (questionnaires and diagnostic interviews) approach. Thirteen of the studies (regardless of the type of intervention) reported significant reductions in PTSD symptoms following treatment. Importantly, however, the majority of these 13 studies also reported that children continued to be symptomatic post-treatment.

The Lockyer Valley floods, 2011

Between November 2010 and January 2011, a series of floods devastated the state of Queensland, Australia. Three quarters of the council areas within the state were declared disaster zones; 90 towns and over 200,000 people were directly affected; damage was estimated at over AUD\$2.38 billion, with a consequent reduction in Australia's GDP of approximately AUD\$30 billion. In total, thirty-three people lost their lives, with another three people still missing. Within the context of this state-wide disaster, on the 10th of January, a series of small rural communities collectively known as the Lockyer Valley (population just under 35,000) experienced what was described as an 'inland tsunami', in which a 'wall of water' (7–8m high at its peak) rapidly swept down the valley. People, houses and cars were washed away by the water, with the official death toll in the Lockyer Valley being 19.

The present study focuses on children living in the Lockyer Valley, represents the most intense level of care in a stepped care model of service delivery, and was conducted within a broader, government-funded post-disaster child and adolescent mental health response led by the authors. In this study, we aimed to:

- Ensure and expedite access to an evidence-based treatment for children in the Lockyer Valley who met criteria for PTSD or PTSS and either an anxiety or depressive disorder 4 months post-disaster by implementing a proactive school-based, 2-stage screen-and-treat approach; and by recruiting post-graduate clinical psychology trainees as the clinical workforce; and to
- Advance the existing treatment effectiveness literature by evaluating a manualized, replicable, cognitive behavioural intervention with a trauma focus (two parent sessions + eight child sessions) using a multi-informant and multi-method approach at multiple time points up to 12-month follow-up.

METHODS

The screen-and-treat approach described here represented the top (most intense) level of a stepped care model (see McDermott & Cobham, 2014 for further details), employed in the immediate aftermath of the Lockyer Valley flood disaster. This project was granted an ethics exemption by the QLD Children's Health Services (RCH; HREC/11/QRCH/153).

Participants

Participants came from four primary schools in the Lockyer Valley. The movement of children through the screen-and-treat process is outlined in Figure 1. Of 316 children enrolled in Grades 3–7 at these schools, parents consented for 150 children (representing an uptake of 47.5%) to participate in the screening process. The mean age of children in the screening cohort was 9.85 years ($SD=1.70$), and 54.9% were female.

Eighty children proceeded to Stage 2 screening (representing 100% uptake of this recommendation). Of these, 48 children were offered the intervention, with 19 children commencing and completing the intervention in its entirety ($M=9.85$ years; $SD 1.70$), with a lack of attrition due to the team's flexibility to

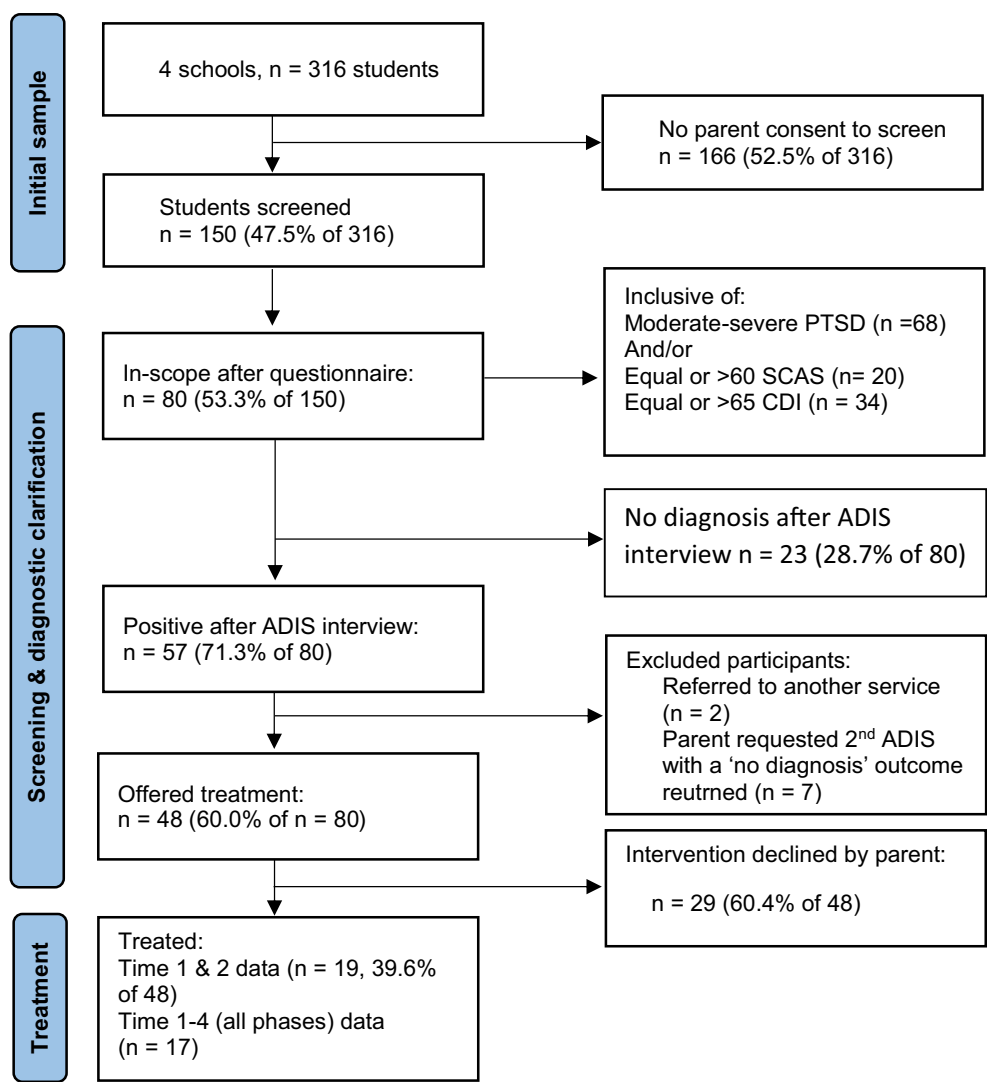


FIGURE 1 Participant screening, diagnosis and treatment summary.

reschedule sessions as required. The median grade level was Grade 5 (where Grade 7 was the final year of primary school). The treatment sample was gender balanced with 10 female participants. In terms of disaster exposure, most participants were at home on the day of the flood disaster (15/19, 78.9%), with approximately half stating their home was damaged during the flood (10/19, 52.6%). Damage varied and included damage to walls, windows and roofs, with loss of possessions and the need for alternate accommodation also common. In terms of threat experience, over one-third of children stated that, over the past month, they had thoughts ‘much’ or ‘most of the time’ about dying in the floods (7/19, 36.8%).

Procedure

Consistent with the stepped care model, once the principals of each of the four Lockyer Valley primary schools had accepted the invitation to be part of the screen-and-treat programme, information sessions were held with teachers and parents. Most parents, however, would have learned about the programme

through a letter outlining the screening and treatment process that went home to each parent with a child in Grades 3–7 at each of the four schools. This letter (see Appendix S1) contained limited information about the intervention – ‘We want to help parents know if their child would benefit from some ongoing emotional support this year’; ‘We anticipate a number of students will be offered assistance’ and ‘Any counselling offered will be explained to parents, will be voluntary and will need parent consent’. As noted, parental consent for screening was obtained for 150 of the 316 eligible children.

Stage 1 screening occurred approximately 2 months post-disaster. Screening questionnaires were read out loud to children in their classrooms by a member of the screening team to mitigate likely variability in literacy levels as well as provide motivation to complete the task. A second member of the screening team walked around the classroom to ensure that children stayed on track and to answer any questions. Screening was conducted by teachers, mental health practitioners or postgraduate clinical psychology trainees, all of whom underwent specific training to undertake the task. Only children with signed parent consent forms were screened.

Parents received feedback about their children's results by letter (please see the Appendix S1) for copies of the letters sent to parents. Where a recommendation for Stage 2 screening was made, this was accompanied by a telephone call from a member of the screen-and-treat team (please see the Appendix S1 for the standardized telephone script used where a recommendation for Stage 2 screening was made). The recommendation to complete Stage 2 screening (completion of the diagnostic interview) was made if either of two conditions were met: (1) the student's score was in the severe to very severe range on the measure of PTSD, or (2) the student's score was in the moderate range on the PTSD measure and in the clinical range on either the measure of anxiety or depression. In a small number of cases, parents who had not received a recommendation to complete Stage 2 screening requested this because they believed their children had under-reported symptoms. In total, 80 children completed Stage 2 screening (which occurred 4 months post-disaster); this represented a 100% uptake of the recommendation to proceed to Stage 2 screening. On the diagnostic interview, if the student met diagnostic criteria for PTSD, a depressive disorder or another anxiety disorder¹ related to the flood disaster, the parent(s) was provided with a letter outlining this information and offering the intervention (see Appendix S1). This was accompanied by a telephone call from a member of the screen-and-treat team providing more detailed verbal information about the trauma-focused CBT intervention (see Appendix S1 for the telephone script used). The intervention was delivered following a second process of obtaining written, informed consent; and commenced in the school term following Stage 2 screening (approximately 5–6 months post-disaster). As noted, 48 children were offered the intervention, with parental consent obtained for 19 children (representing an uptake of 39.5%).

Measures: Stage 1

PTSD was assessed using the Post-traumatic Stress Disorder Reaction Index (PTSD-RI: Steinberg et al., 2004). The PTSD-RI is a 20-question measure that focuses on PTSD symptomatology and is scored on a five-point Likert scale from ‘none of the time’ to ‘all of the time’. In this project, the trauma exposure component of the PTSD-RI was omitted and all symptom questions were explicitly referenced back to the flood disaster. The PTSD-RI total score yields the following categories: doubtful, mild, moderate, severe and very severe PTSD. The psychometric properties of the PTSD-RI are well-established, with consensus that the measure is suitable for both research and clinical use. The scale internal consistency (Cronbach alpha) with this sample was .927.

Depression was assessed using the Children's Depression Inventory – Short Version (CDI-S: Kovacs, 1992). The CDI-S is a 10-item self-report measure based on the original 27-item questionnaire Children's Depression Inventory (Kovacs, 1992). The stem questions relate to anhedonia, ineffectiveness, interpersonal problems, negative mood and negative self-esteem. The child is offered three

¹At the time this project was conducted, PTSD was classified as an anxiety disorder in the DSM-IV.

responses per stem and asked to select the answer that best describes their feelings. The CDI-S has strong psychometric properties for research use and is considered suitable for screening for depression in paediatric populations (Allgaier et al., 2012). In this sample, the internal consistency of the CDI-S was high ($\alpha = .854$). A CDI-ST score equal to or greater than 65 indicates a clinically significant result.

Anxiety was assessed using the Spence Children's Anxiety Scale (SCAS-C; Spence, 1998). A 45-item self-rated measure of how often a child experiences each anxiety symptom, the SCAS consists of subscales (separation anxiety, social phobia, obsessive compulsive, panic/agoraphobia, physical injury fears and generalized anxiety) that reflect DSM-IV anxiety disorders, as well as a total score. Only the total score is reported in this study. A SCAS T score of 60 or above indicates clinical levels of anxiety. In this study, the internal consistency of the SCAS-C was high ($\alpha = .938$).

Measures: Stage 2

Stage 2 screening consisted of parents and identified children separately completing the parent and child versions, respectively, of the Anxiety Disorders Interview Schedule for Children (ADIS-IV-C/P; Silverman & Albano, 1996) to assess each child's diagnostic status. The ADIS-IV-C/P is a semi-structured diagnostic interview that allows for the diagnosis of the most common emotional and behavioural disorders of childhood. Each diagnosis is rated from 0 to 8, with 4 indicating a clinically significant diagnosis. The interview has satisfactory retest reliability (Silverman et al., 2001) and moderate to high interrater reliability. Interviews were conducted in person at children's schools. Parent and child diagnostic data were combined according to the ADIS-IV-C/P recommendations (whereby all diagnoses met according to either parent or child report were incorporated in the final diagnostic composite). Interviews were conducted by the seven trainees as well as by experienced mental health clinicians. All ADIS-IV-C/P interviewers had been trained in the administration of the interview (by watching and discussing video recordings), and all interviews were discussed with, and reviewed (in hard copy) by the first author.

The intervention

Based on the theoretical model of PTSD proposed by Ehlers and Clark (2000), the intervention consisted of two strengths-based and individually administered manualized CBT protocols with a trauma focus: 'My Story of the Flood: What parents need to know and how they can help' and 'My Story of the Flood' (Cobham & McDermott, 2011a, 2011b). The parent programme consisted of 2 sessions (90 min duration) and was delivered first on a weekly basis in children's schools. The child programme consisted of eight weekly sessions (90 min duration) plus a booster session held approximately 2–4 weeks after the completion of the intervention. All sessions were held in children's schools, with clinicians travelling to the Lockyer Valley from Brisbane and typically seeing two clients in one school day. Both parents and children received a workbook that was used in each session. Each family was randomly assigned a clinician who completed both protocols (parent and child) and kept in weekly contact with both the nominated parent (either in-person or by telephone) and the classroom teacher (in-person) during the child programme. Nine trained clinicians delivered the programmes (seven trainees and two experienced clinicians – VEC and BMcd), with each clinician seeing two cases (and one trainee clinician seeing three cases). Given that all clinicians had basic training in CBT, training in the manualized protocol consisted of a 3-hour workshop only. All clinicians attended weekly group supervision to discuss their cases.

The contents of the programmes are outlined in Table 1. All sessions were audio recorded so that treatment adherence could be monitored (for a randomly selected 20% of each session across clinicians) and to enable the transcription of children's stories or trauma narratives. Adherence was excellent, with all content covered and no extraneous content introduced. Key strategies used and/or taught included psychoeducation about PTSS, cognitive restructuring, *in vivo* and imaginal exposure, emotion regulation and behavioural activation. Parents were actively involved in many of the therapy tasks. Children told

TABLE 1 Contents of the manualized trauma-focused CBT protocols.

Session	Title and key content
<i>My Story of the Flood: What parents need to know and how they can help.</i>	
1	Traumatic stress: What is it and how does it work? • A theory of traumatic stress • Important things to know about stories The strategies my child will be learning • Thoughts, The scientific approach, Intruder thoughts and beating them, Avoidance and exposure, Pleasant events scheduling
2	When something really bad happens to a family member • How we are going to talk to your child about grief • The ways families change (e.g., overprotection, talking too much or too little) Managing your child's traumatic stress: How you can help • Parents' ideas about things that help (e.g., re-establish routines) • Using problem solving to help your child
<i>My Story of the Flood</i>	
1	Getting started • Thoughts, Feelings (and keeping track of them), Behaviour, Body signs • Understanding stress • Homework rationale and Rewards • Homework tasks and Summary
2	Introducing your story • Review (last session and homework) • Important things to know about stories • Your story • Thoughts: What are they and why are they important? • Behaviours: Avoidance • Homework tasks and Summary
3	Introducing intruder thoughts and the scientific approach • Review (last session and homework) • Different ways of thinking • Intruder thoughts: What are they? An experiment • Your story • Your story: The 'hot spots' • A scientific approach (to thoughts) • Homework tasks and Summary
4	What I lost • Review (last session and homework) • Feelings and thoughts that kids might have after they lose someone or something important • Your story • Homework tasks and Summary
5	Beating intruder thoughts and being a scientist • Review (last session and homework) • Intruder thoughts: How do you cope?; Beating intruder thoughts • The 'hot spots' in your story • A scientific approach: Recap and practice • Your story • Homework tasks and Summary
6	My big session of cool strategies • Review (last session and homework) • Avoiding your fears • The exposure hierarchy • Pleasant events scheduling • Managing big feelings • Letting go (of unhelpful ways of coping) • Your story • Homework tasks and Summary

TABLE 1 (Continued)

Session	Title and key content
7	Practice, practice and more practice • Review (last session and homework) • The ‘hot spots’ in your story • A scientific approach: Recap and more practice • Solving problems • Your story • Homework tasks and Summary
8	‘I’m so over it!’ • Review (last session and homework) • Let’s practice using the scientific approach with your story • Your story • What has changed since you started? • Planning for the future (just in case) • Letting go: Getting rid of the unhelpful strategies • You’ve done so well!
Booster	Booster session • A blueprint (understanding my traumatic stress and how I’ve managed it)

their story of the flood disaster (imaginal exposure) for the first time in session 2. The story was re-told in each subsequent session, with the therapist becoming an active participant in challenging identified ‘hot spot’ thoughts. Therapists used a script with standard prompt questions (e.g., ‘what do you think might happen?’, ‘what happens next?’) to elicit the story in each session. Children’s stories covered their experiences (including their understanding of their symptoms of PTSD and other people’s responses to them) during and shortly after the flood disaster, as well as their thoughts and feelings about their symptoms of PTSD, other people’s responses to them and any other changes in their lives in the present moment. Therapists used a feelings thermometer to regularly monitor children’s level of distress during storytelling. No adverse events occurred during treatment delivery, indicating that the intervention is safe to use. The intervention was evaluated by completing both Stage 1 (PTSD, anxiety and depression questionnaires) and Stage 2 (parent and child diagnostic interview) measures following completion of treatment and at 6- and 12-month follow-up. In addition, parents completed a 16-item satisfaction questionnaire that covered parents’ opinions about child improvement (e.g., general stress, coping with adverse weather and functioning) and aspects of the intervention (e.g., session content, parent involvement and delivery in schools). Answers were made on a 5-point scale from ‘not at all’ to ‘very much’.

Statistical analysis

Descriptive statistics included percentages, means and standard deviations. The analysis included χ^2 (chi square) for categorical variables and *t* tests for continuous outcome measures. Longitudinal outcomes used ANOVA with measurement phases as the grouping variable. Effect sizes were measured as a post-estimation of ANOVA using the omega-squared method. Consistent with the sample size no multivariate analysis was undertaken. STATA v14 was the analysis package used.

RESULTS

Pre-treatment differences

Comparing students who received treatment with other students screened in their schools, there was no significant difference in gender or age (see Table 2). Unsurprisingly, treated students had

TABLE 2 Demographics and pre-treatment questionnaire scores for children who participated in Stage 1 Screening.

	Treatment <i>N</i> =19	No treatment <i>N</i> =162	χ^2	<i>p</i>
Gender (% female)	54.9%	52.6%	.036 ^a	.848
Age (years; mean, SD)	9.85 (1.70)	10.00 (.82)	.229 ^b	.819
PTSD-RI total (mean, SD)	47.95 (12.88)	25.33 (17.90)	3.605 ^b	.0004
SCAS total T (mean, SD)	45.52 (18.98)	31.26 (20.22)	1.675 ^b	.048
CDI-S total (mean, SD)	6.31 (4.47)	4.02 (4.06)	2.282 ^b	.024

^aStudent's *T* test.

^bFisher's exact.

significantly elevated PTSD, anxiety and depression scores on screening measures compared to non-treated students. The mean score on the PTSD-RI in the non-treatment group is higher than expected, most likely because some of these children either did not meet diagnostic criteria for PTSD (either full or sub-clinical) on the ADIS-IV-C/P or their parents declined the invitation to take up treatment.

Self-report measures

On both the questionnaire and the diagnostic measures of psychopathology used, there were significant decreases in symptoms from pre-treatment to 12-month follow-up (see Table 3). The PTSD-RI symptoms mean total score decreased from 47.95 (12.88) to 7.00 (6.42). Similar changes were noted with the mean total anxiety and depression scores on the SCAS and CDI-S, decreasing from 45.52 (SD 18.98) to 14.44 (SD 13.62) and from 6.63 (SD 4.47) to 1.81 (SD 2.56), respectively. The effect size of the intervention on PTSD symptoms was large (.72, 95% CI .52–.80). Similar large effects were seen for anxiety and depression symptoms (.71, 95% CI .50–.80 and .70, 95% CI .49–.73). On all three self-report questionnaires, the mean total score at 12-month follow-up had moved below the ‘case criteria’. All changes in mean total scores were statistically significant (see Table 3).

Diagnostic status

These changes in psychopathology scores were consistent with changes in diagnostic status on the ADIS-IV-C/P (see Table 3). For example, the total number of mental health diagnoses made on the composite interview decreased from 35 (pre-treatment) to 4 (12-month follow-up). Specifically, 17 children met criteria for a full PTSD diagnosis (and 2 for a sub-clinical PTSD diagnosis) at pre-treatment, while no children met criteria for either full or sub-clinical PTSD at 12-month follow-up. Sixteen children also met criteria for ‘any other anxiety diagnosis’ at pre-treatment, reducing to four children at 12-month follow-up.

Trainee outcomes

The two experienced clinicians possibly saw participants with higher symptom scores (PTSD-RI total score 54.5 (12.5) vs. 46.2 (12.8), *t*=1.156, *p*=.264), although this was not statistically significant. At 12-month follow-up, individuals seen by experienced and non-experienced clinicians had similar low mean total PTSD symptom scores (7.2 (SD 5.1) vs. 6.92 (SD7.0), *t*=.087, *p*=.932); these results were not significantly different. Unfortunately, the study was not powered to examine this comparison in more detail.

TABLE 3 Treatment Outcome: Questionnaire measures and diagnoses over time.

	Pre-treatment N=19	Post-treatment N=19	Post-6 months N=17	Post-12 months N=17	Statistic	p
Participant psychopathology						
PTSD-RI total score (Mean, SD)	47.95 (12.88)	11.63 (10.03)	9.65 (10.99)	7.0 (6.42)	62.92 ^a	.000
SCAS total score (Mean, SD)	45.52 (18.98)	19.63 (15.69)	14.94 (13.80)	14.44 (13.62)	14.59 ^a	.000
CDI-S total score (Mean, SD)	6.63 (4.47)	1.67 (2.35)	3.05 (1.81)	1.81 (2.56)	8.86 ^a	.001
Participants meeting diagnostic criteria						
PTSD diagnosis N (%)	17/19 (89.5)	2/19 (10.5)	0/17 (.0)	0/17 (.0)	53.575 ^b	.000
Anxiety diagnosis N (%)	16/19 (84.2)	8/19 (42.1)	6/17 (35.3)	4/17 (23.5)	22.702 ^b	.000
Depression diagnosis N (%)	2/19 (10.5)	1/19 (5.3)	2/17 (11.8)	0/17 (.0)	NA	.558 ^c
All diagnoses N (%)	35/19 (95.0)	11/19 (57.9)	8/17 (47.0)	4/17 (23.5)	22.517 ^b	.000

^aANOVA.

^b χ^2 .

^cFisher's exact.

Parent satisfaction

Eighteen parents completed the satisfaction measure. Parents noted very high satisfaction with the (in school) delivery of the therapy programme (95.2%). Very high levels of satisfaction were reported for the two parent sessions (90.0%) and communication with therapists (90.5%). Most parents (71.4%) reported they had read their child's workbook. Seven parents reported their children's therapy tasks to be highly ('very much') useful to their own emotional recovery. Most parents (85.7%) reported they would recommend the intervention 'very much'. Free text feedback in answer to the question, 'was there anything you found particularly useful?' included the following comments from different parents:

- 'Strategies taught in parent sessions v. helpful.'
- '[child] being able to tell story. Could notice the difference from session 1'.
- 'Talking about it so they could face it. They were blocking it previously'.
- 'Great – held @ school, supportive to kids as others were doing it also, more like a learning session at school'.
- 'Coping skills applied well with other areas of her life, good to make sure she had dealt with it straight up'.
- 'Liked it working from school, fit into schedule well, sceptical at first, changed over time'.

DISCUSSION

The first aim of this study was to expedite access to an evidence-based intervention for children meeting criteria for PTSD 4–6 months post-disaster by using a school-based screen-and-treat model and a workforce consisting largely of clinical psychology trainees. This aim is in line with access challenges identified by many other researchers and the proposal that school-based screening and treatment represents an effective means of addressing these challenges (e.g., Danese et al., 2020; Scheeringa et al., 2014). Despite the challenges of low rates of uptake, we believe this aim was met and that the model described here represents a scalable means of increasing access for children post-disaster to evidence-based clinical services, particularly in the type of rural and low socio-economic community described in this paper.

Previously, little has been known about the uptake of school-based screen-and-treat programmes in a post-disaster context. In this study, parental consent was obtained for less than half of all children for whom school-based screening was offered. This clearly represents an important challenge and one that

is consistent with recruitment challenges reported by most treatment studies aiming to address PTSD in children and adolescents, regardless of the type of trauma exposure (e.g., March et al., 2015; Peltonen & Kangaslampi, 2019). Indeed, post-disaster contexts appear to represent particularly difficult recruitment environments, with Jaycox et al. (2010) noting that, following exposure to Hurricane Katrina, only 35% of families returned an assessment consent form. We are not aware of research addressing the question of why such a high proportion of families do not take up the offer of either a brief screening process or a more thorough assessment following their children's exposure to a potentially traumatic event. Many suggestions, however, have been put forward across multiple different research papers, including a lack of parental 'buy-in' around the idea that children might experience post-traumatic stress; a fear of stigma attached to a mental health assessment; and children's own reluctance or refusal to engage. More specific to disaster exposure, it has been hypothesized that parents' capacity to see their children's distress may be compromised by their own distress and/or preoccupation with practical tasks. Another important consideration is parental literacy levels. In this study (as in most), all information was provided in writing, which may have posed a barrier for some parents. Additional considerations include the fact that the information/consent letter about screening did not note that the intervention would be free of charge, nor did it contain any information about the intervention. However, many of the parents knew from attending the information session that the intervention was free, and we are relatively confident that this information would have been communicated within the small communities. In relation to the lack of information about the intervention, it is difficult to predict what effect (if any) this might have had on uptake. Our concern at this point was overwhelming parents with information.

Once engaged in the screening process, families in this study demonstrated significant commitment, with 100% of families recommended to complete Stage 2 screening doing so (it is, however, noteworthy that a small percentage of parents requested a second diagnostic assessment as they felt their children had misrepresented their symptoms in the first interview; these families all returned a 'nil diagnosis' result on the second ADIS-IV-C/P). The 2-stage screening process was effective in identifying children in need of treatment, with just over 71% of the children identified at Stage 1 screening 2 months previously determined to require treatment after undertaking this more rigorous, multi-informant assessment. Importantly, almost 29% of children identified at Stage 1 were determined to not require treatment through the process of Stage 2 screening. This is consistent with trajectory research indicating that a proportion of symptomatic children will not require intervention to recover within that first 6-month window. The 2-stage screening process thus functioned as a highly effective identification pathway.

A somewhat similar pattern of uptake and then engagement was seen in the 'treat' component of the process. Thus, parental consent was obtained for treatment participation for just under 40% of children to whom treatment was offered. For those families who did accept the treatment offer, engagement was excellent (with all parent and child sessions completed by all families and high levels of satisfaction reported). The low uptake at this point was more surprising to us, although once again, it is consistent with Jaycox et al.'s (2010) finding that only 23% of families who were offered free TF-CBT in the aftermath of Hurricane Katrina commenced the intervention, with a smaller proportion completing the intervention. As with the issue of low uptake of Stage 1 screening, we have been unable to find research addressing the specific question of why parents who have been offered a free, evidence-based intervention (after a thorough assessment process and a detailed description of the programme) do not accept this offer. However, we can speculate on possible reasons. Some of these may have involved: prioritization of the practical aspects of recovery (e.g., fixing home damage); parental and/or child anxiety about the process of 'retelling' their story; parents' belief that 'I'm ok, therefore they must be ok'; difficulty in acknowledging children's distress (perhaps related to parents' own posttraumatic stress and/or grief); stigma associated with their child receiving therapy (notably the 'convenience' of offering the intervention at school may have worked against us in relation to stigma); hope that children's distress would improve with more time; and minimization of children's symptoms.

Trainees made up most of the workforce for this project and obtained excellent outcomes for the children they treated (with no differences found between trainees and the two experienced clinicians

delivering therapy). This suggests that, in the context of delivering a manualized, evidence-based intervention and being provided with weekly supervision, relatively inexperienced trainee clinicians may indeed represent a feasible and effective solution to the workforce problem experienced in a post-disaster environment. This is critical given that, even in countries with relatively well-resourced mental health services, when a natural disaster occurs, existing clinical services have limited to nil capacity to undertake the work described here. The effectiveness of the trainees enhances the scalability of the screen-and-treat approach. Importantly, anecdotal feedback from the trainees indicated that they found the 3-hour training to be sufficient, the manualized intervention to be easy to follow and supervision to be crucial to their overwhelmingly positive learning experiences.

The second aim of the study was to evaluate a manualized, replicable CBT intervention with a trauma focus using a multi-informant and multi-method approach (self-report questionnaires and a clinician-administered diagnostic interview with children and parents) at post-treatment and 6- and 12-month follow-up. As noted, parental consent was a roadblock to participation; thus, it seems probable that the 19 children who did participate came from families who were motivated to access and engage in treatment for their children. However, in terms of access to treatment, it is critical to note that the majority of parents who engaged at any point (including the 19 families who participated in treatment) expressed surprise at the idea that their children might be struggling emotionally. Not due to lack of care but to lack of information. Related to how to address the issue of low uptake in this study, there needs to be more public health messaging about the importance of post-disaster mental health needs across the age range. Given that adults act as their gatekeepers to care, children in particular need to be proactively identified. Families who participated were highly engaged with the programme, with all families attending all sessions, and parental satisfaction with the programme was high. Children's outcomes (as measured by self-report and the ADIS-IV-C/P) were excellent. Reductions in PTSD symptomatology occurred mainly from pre- to post-treatment and were then maintained up to the 12-month follow-up point. Looking specifically at diagnostic status, only 10.5% of children met criteria for PTSD at post-treatment on the composite parent-child ADIS-IV-C/P, with this dropping to 0% at 6- and 12-month follow-ups. Anxiety symptoms followed a similar pattern, with most of the reported reduction happening from pre- to post-treatment, although the continuation of gains over time was more pronounced here, with 84.2%, 42.1%, 35.3% and 23.5% of children meeting criteria for any other anxiety disorder at pre-, post-treatment, 6-month and 12-month follow-up, respectively. Depressive symptoms were less prominent in this sample compared to post-disaster samples described by other researchers (e.g., Lai et al., 2017) and showed a small spike at the 6-month follow-up point, but largely demonstrated a reduction from pre- to post-treatment that was maintained at 12-month follow-up. These data suggest that this manualized, replicable CBT intervention with a trauma focus is a highly effective programme for the treatment of PTSD, comorbid anxiety and depressive symptomatology in children post-disaster.

Strengths of this paper include the use of a rigorous screening process that followed children's information in the first instance (by relying on self-report questionnaires at Stage 1) but was nuanced enough to be able to incorporate parental information (e.g., by interviewing children whose parents felt they had under-reported symptoms) in determining which children proceeded to Stage 2 screening. The multi-informant approach taken to the clinician-administered diagnostic interview that constituted Stage 2 screening was important, as was the time-lag between Stages 1 and 2 (which allowed for identification of children whose symptoms had resolved from the 2-month post-disaster mark to the 4-month post-disaster mark). The use of the diagnostic interview also allowed the team to understand which children were experiencing non-disaster-related mental health problems, requiring referral to the regional mental health service. The use of a manualized and replicable intervention with parent and child workbooks is also a strength of this paper, as is the fact that treatment adherence was examined.

Limitations of this study include the fact that the screen-and-treat approach described occurred in the context of a funded post-disaster response conducted in a country with training programmes for mental health practitioners. This means that neither the screening approach nor the workforce solution are necessarily generalizable to other parts of the world. The fact that there was no control group and

that the sample was small also represents limitations. However, it is important to note that this work was undertaken in the spirit of post-disaster clinical service provision rather than research.

Important directions for future research include understanding why the initial uptake of screening was less than 50% and why more than 60% of families (after participating in a thorough diagnostic interview) declined the offer of a free, evidence-based intervention delivered in their school. Parents in this project were provided with a great deal of information regarding the rationale for and benefits of both the screening process and the manualized intervention. And yet, the uptake of both of these elements was less than anticipated. Proposed solutions include more effective 'marketing' of the screen-and-treat programme. For example, we relied on written materials for engaging parents in the screening process: this may have been problematic in terms of parental literacy. Qualitative feedback around barriers and enablers from caregivers and young people who engaged in a TF-CBT intervention (noting that these may be different for those who do not engage) suggests that videos and testimonials focusing on the stories of others who have done the programme may be an effective way to market TF-CBT (Okamura et al., 2020). In the future, we would consider, as a means of improving the treatment acceptance rate, incorporating key content from the two parent intervention sessions into a brief informational video that parents viewed before being asked to provide consent for their children's involvement in treatment. Providing parents and children with access to such video content would also overcome the potential obstacle of parental literacy. Ideally, qualitative interviews or focus groups would have been conducted with parents at the time to understand the barriers for them in (a) agreeing to screening and (b) accepting an intervention. In the context of this public health service initiative, we were even more than usually mindful of the importance of respecting parents' decisions and did not press parents for their reasons for not engaging with treatment. Other important future directions include health economics – namely, what are the costs of implementing this kind of screen-and-treat approach versus the costs of not implementing it? In terms of scalability, it is also crucial to investigate whether the approach described in this paper could be delivered via telehealth. Finally, dismantling research to investigate the principle of minimal sufficiency in treatment programmes for children experiencing PTSD following disaster exposure represents an important future research direction – specifically, could an intervention such as one described here omit the direct work with trauma memories (the idea of which may have been a barrier for parents) and obtain the same as excellent outcomes, as has been suggested by recent work with adults (Thew et al., 2023).

In conclusion, the screen-and-treat approach described meant that consented children received a thorough mental health assessment and access to an evidence-based, highly effective intervention as required. It is highly likely that, as a result of a lack of appropriate clinical services and parental reluctance to present children for assessment and treatment in a post-disaster environment, these children would not have otherwise received mental health care. Provision of these services would not have been possible without government funding, but equally, it would not have been possible without the trainee workforce. The model of screen-and-treat described (including the use of trainees) represents an innovative blueprint for expediting children's access to quality mental health care post-disaster. The approach described here was highly effective for the families who participated. The focus needs to be on increasing this number.

AUTHOR CONTRIBUTIONS

Vanessa E. Cobham: Conceptualization; investigation; writing – original draft; methodology; writing – review and editing; supervision; resources; project administration. **Brett McDermott:** Conceptualization; investigation; methodology; writing – review and editing; formal analysis; data curation; resources.

ACKNOWLEDGEMENTS

The authors would like to thank the participating children, parents and school staff; as well as the clinicians who delivered therapy. Open access publishing facilitated by The University of Queensland, as part of the Wiley - The University of Queensland agreement via the Council of Australian University Librarians.

FUNDING INFORMATION

The screen-and-treat approach described in this paper was part of a larger statewide, post-disaster mental health response funded by the Australian federal government.

CONFLICT OF INTEREST STATEMENT

None to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ORCID

Vanessa E. Cobham  <https://orcid.org/0000-0002-7633-2971>

Brett McDermott  <https://orcid.org/0000-0002-6639-1767>

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Cobham, V. E., & McDermott, B. (2025). 'School-based screen-and-treat': An effective blueprint for expediting access to care in children experiencing PTSD following disasters. *British Journal of Clinical Psychology*, 64, 47–62. <https://doi.org/10.1111/bjc.12475>