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# Systematic review and meta-analysis: do best-evidenced trauma-focused interventions for children and young people with PTSD lead to changes in social and interpersonal domains?

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## ABSTRACT

**Objective:** Young people with post-traumatic stress disorder experience difficulties in social and interpersonal domains. We examined whether the best-evidenced treatments of PTSD for children and young people (Trauma-focussed Cognitive Behavioural Therapy or Eye Movement Desensitisation and Reprocessing; aged 5–25) improve social or interpersonal factors in randomised controlled trials, compared to a comparator condition.

**Method:** The review was preregistered on PROSPERO (CRD42023455615; 18th August 2023). Web of Science Core Collection, EMBASE, CINAHL, Pubmed, PsycINFO, Cochrane Central Register of Controlled Trials and PTSDpubs were searched, and data were extracted for social and interpersonal outcomes post treatment. A random effect meta-analysis was conducted to obtain between-group pooled effect size estimates.

**Results:** The search resulted in 792 studies, of which 17 met our inclusion criteria ( $N = 2498$ ). Our meta-analysis included 13 studies which investigated social skills and functioning, revealing a small but non-significant effect favouring the evidence-based treatment versus comparison ( $g = .20$ , 95% CI  $[-0.03, 0.44]$ ,  $p = .09$ ). We narratively synthesised six studies which reported other social-related outcomes (e.g. perceptions of social support), and four out of six reported improved social domain outcomes for the evidence-based PTSD treatment condition. There was a large amount of heterogeneity, with no evidence that this could be explained by moderators.

**Conclusion:** Few trials report on social and interpersonal outcomes, and where they are reported the evidence is mixed. It may be that trauma-focused therapies for PTSD need to be adapted in some circumstances, so that they address social and interpersonal deficits often seen in children and young people with PTSD.

## Revisión sistemática y metaanálisis: ¿Las intervenciones centradas en el trauma con mejor evidencia para niños y jóvenes con TEPT conducen a cambios en los dominios sociales e interpersonales?

**Objetivo:** Los jóvenes con trastorno de estrés postraumático experimentan dificultades en los dominios sociales e interpersonales. Examinamos si los tratamientos con mejor evidencia para el TEPT para niños y jóvenes (terapia cognitivo-conductual centrada en el trauma o desensibilización y reprocesamiento por movimientos oculares; de 5 a 25 años) mejoran los factores sociales o interpersonales en ensayos controlados aleatorizados, en contraste con una condición de comparación.

**Método:** La revisión se registró previamente en PROSPERO (CRD42023455615; 18 de agosto de 2023). Se realizaron búsquedas en Web of Science Core Collection, EMBASE, CINAHL, Pubmed, PsycINFO, Cochrane Central Register of Controlled Trials y PTSDpubs, y se extrajeron datos de los resultados sociales e interpersonales posteriores al tratamiento. Se realizó un metaanálisis de efectos aleatorios para obtener estimaciones del tamaño del efecto agrupado entre grupos.

**Resultados:** La búsqueda arrojó 792 estudios, de los cuales 17 cumplieron con nuestros criterios de inclusión ( $N = 2.498$ ). Nuestro metaanálisis incluyó 13 estudios que investigaron las habilidades y funcionamiento social, revelando un efecto pequeño, pero no significativo a favor del tratamiento basado en evidencia versus la comparación ( $g = .20$ , IC del 95%  $[-0.03, 0.44]$ ,  $p = .09$ ). Sintetizamos narrativamente seis estudios que reportaron otros resultados relacionados con lo social (p. e., percepciones de apoyo social), y cuatro de seis reportaron mejores resultados en el dominio social para la condición de tratamiento del TEPT basado en evidencia. Hubo una gran cantidad de heterogeneidad, sin evidencia de que esto pudiera explicarse por moderadores.

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## KEYWORDS

Trauma; treatment; PTSD; children; adolescents; social support

## PALABRAS CLAVE

Salud mental; niños; adolescentes; trauma; TEPT; tratamiento; apoyo social

## HIGHLIGHTS

- We used a systematic review and meta-analysis to see whether the best treatments for PTSD in children and young people (aged 5–25) improve social or interpersonal factors. These treatments include Trauma-Focused Cognitive Behavioural Therapy and Eye Movement Desensitisation and Reprocessing.
- Our meta-analysis looked at 13 studies and found a small but not significant improvement in social functioning for those who received the evidence-based treatments compared to other conditions.
- We found that few studies report on social and interpersonal outcomes, and when they do the results are mixed. Trauma-focused therapies for PTSD might need to be adjusted to better address social and interpersonal issues in young people.

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**Conclusión:** Pocos ensayos reportan resultados sociales e interpersonales, y cuando se reportan, la evidencia es mixta. Es posible que las terapias centradas en el trauma para el TEPT deban adaptarse en algunas circunstancias, de modo que aborden los déficits sociales e interpersonales que suelen observarse en niños y jóvenes con TEPT.

## 1. Introduction

Epidemiological studies estimate that 30–60% of people experience at least one potentially traumatic event before their 18th birthday (Lewis et al., 2019; McLaughlin et al., 2013). Events which can potentially traumatic involve witnessing or experiencing danger of death, serious injury or sexual violence to themselves, or learning about a caregiver experiencing these events (ICD-11, 2021). It is estimated that around 1 in 6 trauma-exposed children develop post-traumatic stress disorder (PTSD), and rates are higher for those who have experienced repeated and prolonged trauma (Alisic et al., 2014; Cecil et al., 2017; Lewis et al., 2021). PTSD is characterised by involuntary reexperiencing (e.g. flashbacks, nightmares), avoidance (e.g. places, people), changes in cognitions or mood (e.g. negative beliefs about oneself, others or the world) and changes in arousal (e.g. hypervigilance, concentration or sleep difficulties; ICD-11, 2021). If left unaddressed, PTSD is associated with a wide range of poor outcomes, including comorbidity, substance misuse, and suicidality (Lewis et al., 2019; Xiao et al., 2022).

One area that can be significantly affected for children with PTSD is social support and interpersonal functioning (Allen et al., 2021; Lewis et al., 2019; Trickey et al., 2012). In a population representative epidemiological study, Lewis et al. (2019) found that around 50% of children with PTSD reported social isolation and loneliness, compared to around 25% of non-traumatised peers, and 28% of the traumatised youth without PTSD. In theory, having high social support buffers against the development of PTSD following a potentially traumatic event (Cohen & Wills, 1985). Simultaneously, PTSD may also lead to or exacerbate interpersonal challenges, including potentially reducing social support over time (Allen et al., 2021). A meta-analysis of longitudinal research indicated social support and PTSD may reciprocally predict each other over time, indicating that this relationship might be bi-directional (Wang et al., 2021). However, it should be noted that a recent re-analysis of Wang et al. (2021) raised concerns that these findings may be due to a statistical effect, meaning some caution should be taken around direction of causation (Sorjonen & Melin, 2023). Regardless, there is substantial evidence that these poor social and interpersonal outcomes are associated with PTSD in children cross-sectionally,

and more research is needed to understand the nature of this association (Allen et al., 2021).

Social and interpersonal factors are a broad and multidimensional concept. Consistently, research finds that perceptions of social support (i.e. attitudes and beliefs about the availability and adequacy of support; Barrera, 1986), are a stronger predictor of mental health than quantitative features (e.g. number of friends, frequency of contact), including in trauma-exposed populations (Melkman, 2017). There are several forms of social support, including emotional support, instrumental or practical support, or advice and guidance (Thoits, 2011). A related concept is social skills, functioning or competency, which refers to one's ability to interact with and relate to others in a way that follows social roles and promotes personal and interpersonal goals (Bosc, 2000). Again, research consistently finds that young people with PTSD experience difficulties with social functioning too (Forresi et al., 2020; MacLean et al., 2019; Villalta et al., 2020). There are several studies which demonstrate that PTSD is associated with relationship strain in child–parent dyads (Cushing et al., 2023). Finally, there are several socially relevant neurocognitive factors which have been studied in the context of childhood trauma such as differences in threat detection or facial expression (emotion) processing (McCrorry & Viding, 2015; McLaughlin et al., 2020). As a next step, it is important to understand the extent to which our best-practice PTSD treatments successfully address these different social and interpersonal deficits, and whether these processes may be mechanisms for recovery from PTSD.

There are several theoretical explanations which point to the importance of social support in buffering the risk of PTSD. Appraisals are central to theoretical explanations of the development and maintenance of PTSD, and one hypothesis is that social interactions may impact cognitive appraisals about the trauma, self and the world (Ehlers & Clark, 2000). Indeed, a recent review indicated that parents influence the way children appraise a traumatic event, encouraging trauma discussion or avoidance (Afzal et al., 2023). Parental support may also help young people regulate their emotions, which has associations with fewer PTSD symptoms following trauma (Crow et al., 2021; Powers et al., 2022). Warm and caring caregiver-child interactions may also be a source of positive experiences for children, which could buffer

PTSD development. For example, in a sample of around 100 sexually abused children, more maternal warmth and emotional support was associated with fewer PTSD symptoms 9 months following trauma (Zajac et al., 2015). Beyond parent–child interactions, prospective and cross-sectional research investigating broader social networks (e.g. family, friends, special person), also indicates the influence of wider-network social support for PTSD development (e.g. friends, teachers; Hitchcock et al., 2015; Münzer et al., 2017). Social interactions could also increase risk of PTSD development, though this has been under researched in child and adolescent samples. For example, cross-sectional research with adults indicates that negative social reactions to trauma disclosure (e.g. stigmatisation) is related to worse PTSD symptomology (Davis et al., 1991; Ullman et al., 2001).

It is also understood that PTSD may negatively impact upon the availability of social support but this direction is under researched in children (Allen et al., 2021). It may be that PTSD symptomatology itself erodes the social networks or social skills of children (social erosion hypothesis; Norris & Kaniasty, 1996). Alternatively, negative and over-general appraisals about a threatening world, which are a characteristic experience for people with PTSD, may cause a child to view their social network differently and withdraw from their social circles. Lai et al. (2018) found that higher child PTSD symptoms were associated with perceived reductions in parent, peer and teacher support across the first two years following a traumatising event. Children and young people with PTSD may also have apprehensions around seeking support from others, which leads to social isolation. Indeed, qualitative research involving adolescents and adults who have experienced childhood trauma show that many traumatised people prefer self-management strategies, which can delay support-seeking from their social network (Stige et al., 2013; Truss et al., 2023).

In sum, research indicates that lack of social support and interpersonal factors may be important in the maintenance of PTSD, and it may be a significant deficit for young people with PTSD. As such, understanding how social and interpersonal factors may change in response to treatment for PTSD is important. At present, the best-evidenced treatment for children who have PTSD are trauma-focussed cognitive behavioural therapies (tf-CBT). Tf-CBTs are the first-line recommended treatment for children with PTSD within healthcare settings in the U.K. and other agencies internationally (e.g. Centre for Disease Control and Prevention, 2010; National Health and Medical Research Council, 2013; National Institute for Health and Care Excellence, 2020). Though there is a smaller evidence-base for the effectiveness, and cost-effectiveness of Eye Movement Desensitisation and Reprocessing Therapy (EMDR; Leenarts et al., 2013; Mavranouzouli et al.,

2020), this is usually indicated as another treatment option for PTSD in children. Meta-analytic reviews show that these treatments (particularly tf-CBTs) reduce common comorbidities, such as depression and anxiety (Bastien et al., 2020; Davis et al., 2023; Leenarts et al., 2013; Mavranouzouli et al., 2020). However, there has been less systematic focus on whether such treatments might drive change in broader domains, including social and interpersonal factors in children.

A recent review with adult populations, demonstrated tf-CBT had a medium positive effect upon interpersonal functioning (Swerdlow et al., 2023). This is despite interpersonal outcomes not being central to the theories underlying tf-CBT, nor a key treatment target with these interventions. It may be that the changes in maladaptive appraisals as part of treatment, lead to further improvements in social domains cognitions (e.g. reductions in thoughts like ‘I can’t trust anyone’). Or simply reducing symptoms of trauma-related distress may allow people to re-engage with their social networks. To date this is unexplored in children and young people. Other therapy-related factors may moderate the extent to which social and interpersonal domains improve. For example, the inclusion of caregivers in therapy may improve child–parent relations. Group therapy may allow previously isolated children and adolescents with PTSD the opportunity to engage with and relate to peers in a safe and supportive environment. It is also important to establish whether tf-CBTs and EMDR improve social support, and whether findings translate across different economic and cultural contexts (e.g. low/middle-income or high-income countries).

Previous studies have established that PTSD is linked to poorer social and interpersonal outcomes. Less is known about whether the best-evidenced treatments for PTSD can also improve these domains in children and adolescents (i.e. aged up to 25; Sawyer et al., 2018). Knowing this would help us understand whether the current best treatments can be expected to improve the access to future social support, or whether broad treatment outcomes could be improved by including interventions focussing on the social domain. Using a meta-analytic approach we explored whether best-evidenced child PTSD treatments (tf-CBTs, EMDR) were associated with improved outcomes on social domains, compared to comparison groups. In line with recent reviews examining best-evidenced PTSD treatments, and meta-analysis guidelines (e.g. Davis et al., 2023; Swerdlow et al., 2023), we also explored key potential moderators, including: whether the comparator was passive or active; whether the therapy was group or individual; the involvement or caregivers; country context (i.e. low-and-middle, or high-income countries) and therapy type (tf-CBTs or EMDR).

### 1.1. Method

This meta-analysis was preregistered on PROSPERO (CRD42023455615; 18th August 2023) and followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses reporting guidelines (PRISMA; Page et al., 2021). PRISMA checklist is available in supplementary materials (see Supplement 1). Our review questions were:

- (1) Do best-evidenced trauma-focussed therapies for children and young people (tf-CBTs or EMDR) change social or interpersonal factors (e.g. perceived social support, social functioning), when compared with passive and active control conditions?
- (2) Are findings moderated by (i) type of intervention (tf-CBT v EMDR), (ii) comparison condition (active/passive), (iii) trauma type (some interpersonal/no interpersonal), (iv) therapy format (mostly group/mostly individual), (v) caregiver-involvement (some/none), or (vi) region type (low-middle income/high income)?

### 1.2. Eligibility criteria

Eligible studies were: (1) randomised controlled trials which compared tf-CBTs or EMDR therapy with a passive or active control group (see Table 1 for definitions); (2) had participant groups with a mean age between 5 and 25; (3) involved participants with clinically elevated PTSD symptoms at baseline, as defined by either a diagnostic interview or reaching above a clinical cut-off on a validated symptom measure, via either self-report or caregiver report; (4) where PTSD or complex PTSD was the primary target of the intervention; (5) included interventions that were mostly in-person (>50%), and were either group or individual therapy; (6) in line with U.K. NICE guidelines, the entire course of therapy was at

least five sessions in the case of group therapy, and six for individual therapy; (7) studies had a validated measure of social and interpersonal factor as an outcome (see Supplement 3 for definitions); (8) there were no limitations on publication date, nor language. To maintain methodological consistency and focus exclusively on empirically robust research, we limited our inclusion to peer-reviewed studies.

### 1.3. Search strategy

Searches were run within Web of Science Core Collection, EMBASE, CINAHL, Pubmed, PsycINFO, Cochrane Central Register of Controlled Trials (CENTRAL) and PTSDpubs on 30th of June 2023. Databases were searched using relevant medical subject headings (MeSH), free-text terms and study type filters where appropriate. Specific search strategies were developed with a subject-specific librarian not otherwise associated with the project. Full search terms are available within supplementary materials (see Supplement 4). To ensure literature saturation, we scanned the reference lists of included studies, as well as recent relevant reviews identified through the search.

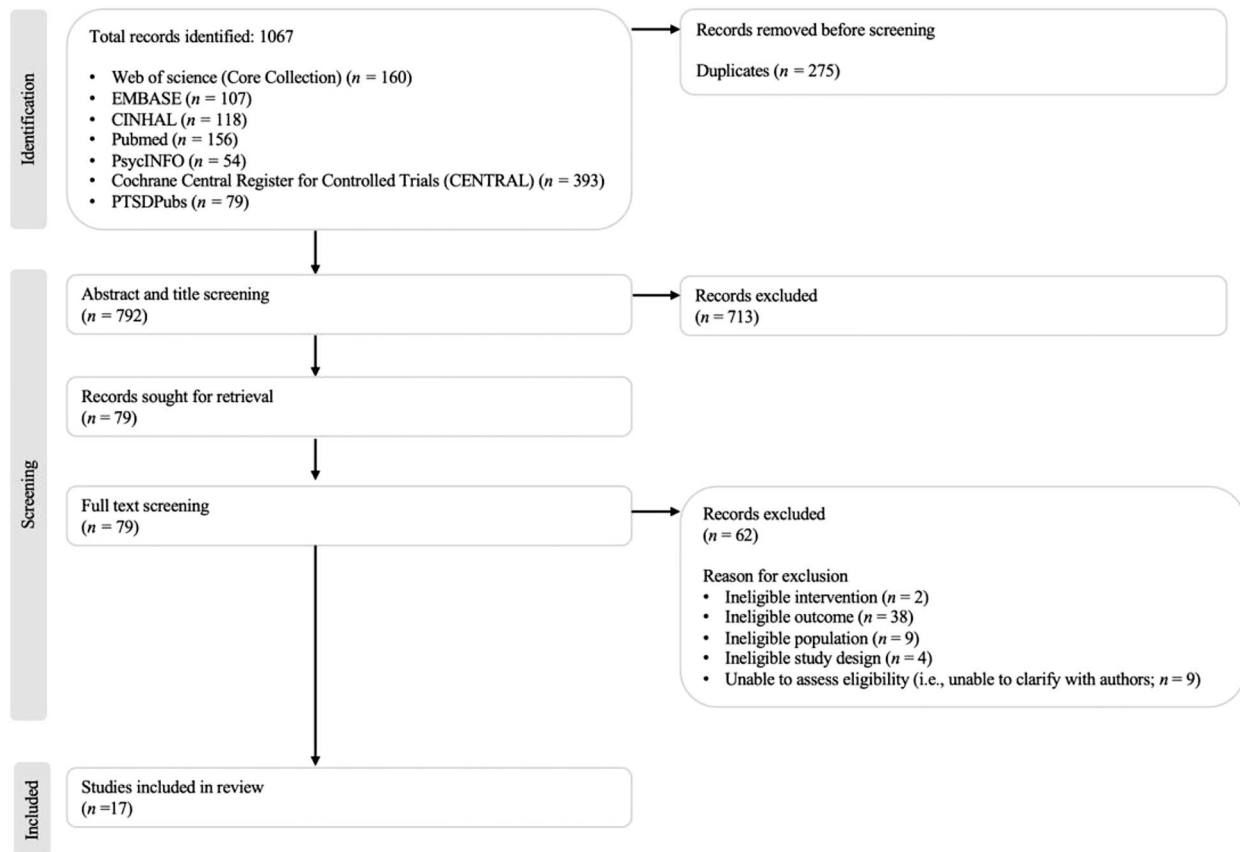
### 1.4. Selection process and data extraction

Titles and abstracts were imported into Covidence (<https://www.covidence.org/>), where we removed duplicate records (see Figure 1). First titles and abstracts were split evenly between the screening team (AP, HO & SR) and were independently screened against inclusion criteria (see above). All papers were then double screened (87% agreement). This process was repeated with full texts, comparing them to eligibility criteria (90% agreement). Disagreements were resolved through a consensus meetings. Two authors (AP & SR) independently extracted descriptive and quantitative data using a charting

**Table 1.** Definitions of tf-CBT and EMDR.

Social or interpersonal outcome	Description	Number of studies identified which utilise this therapy
Trauma-Focussed Cognitive Behavioural Therapy (tf-CBT)	In line with guidance developed by National Institute for Health and Care Excellence (2020), tf-CBT must include therapeutic elements such as: psychoeducation, elaboration and processing of trauma memories and emotions, restructuring of trauma-related meanings and support to overcome avoidance. Examples of tf-cbt include Narrative Exposure Therapy (Schauer et al., 2011); Prolonged Exposure, Teaching Recovery Techniques and TF-CBT (Cohen et al., 2006).	$k = 16$
Eye Movement Desensitisation and Reprocessing Therapy (EMDR)	EMDR is more narrowly defined as the manualised treatment developed by Shapiro (1989), based upon the Adaptive Information Processing model. According to this model, various components of trauma memories (emotional, sensory, cognitive and physiological), are stored in a 'dysfunctional' and 'unprocessed' way. Bilateral stimulation (e.g. having clients move their eyes rapidly while focusing on the traumatic memory), increases neuronal activity whilst undergoing imagined exposure to trauma events, and consequently decreases trauma-related fear behaviour (Shapiro, 2007).	$k = 1$

Note: See supplementary materials for more information on definitions.



**Figure 1.** PRISMA diagram of systematic search.

form within Excel. Quality checks were conducted by the same reviewers. Where necessary, authors were contacted for additional information, and if no reply was received after 1-month studies were excluded (see Supplement 5 for information on which studies were excluded and why).

Information was extracted regarding the social and interpersonal outcome measure used, informant (e.g. self, carer, teacher) and type of social outcome measured. These categories were derived from common definitions used in the field and recent related meta-analyses in the field (see Supplement 3 for more information). Where available, we extracted means and standard deviations for all available time points, along with within and between-group effect sizes. Study details included the country in which the study was conducted, the setting in which the intervention occurred (e.g. school, mental health setting), the total sample size, comparison condition (active or passive), and follow-up periods. We also gathered intervention details (therapeutic manual, number of sessions, length of sessions, caregiver involvement (some, none)) and therapy format (online, in person). Participant demographic information included participant age (mean and standard deviation), nationality/ethnicity, gender/sex (ns and percentages). Where reported we gathered information around trauma history, and measures of PTSD.

Risk of bias for the outcome measure was first independently assessed by two assessors (AP, SR) using the Cochrane Risk of Bias (RoB 2.0). Double checking resulted in an agreement of 94%. Disagreements were resolved by discussion.

### 1.5. Synthesis methods

Papers were categorised by the social and interpersonal domain they investigated (see Table 2). We narratively synthesised studies which investigate perceptions of support, relationship quality, and social cognitions, given they were infrequently investigated and heterogeneous in design, so unsuitable for meta-analyses methods. We meta-analysed studies which investigated social skills or functioning outcomes. These studies were consistent in relation to the concept they measured, and the questionnaire they used (i.e. Strengths and Difficulties Questionnaire (SDQ), Child Behaviour Checklist (CBCL)).

#### 1.5.1. Meta-analysis

We conducted a random-effects meta-analysis using the R package metafor (<https://cran.r-project.org/web/packages/metafor/index.html>; Viechtbauer, 2010). Hedge's  $g$  statistic was derived for each study. A positive Hedge's  $g$  statistic indicates an effect favouring the experimental condition, indicating higher social and

**Table 2.** Overview of social support and interpersonal outcomes.

Social or interpersonal outcome	Description	Number of studies identified which investigate this outcome
Network features	Reported size and density of support network (i.e. number of close friends)	None identified
Enacted support	Frequency with which support has been received	None identified
Perceptions of support	Attitudes and beliefs about the availability and adequacy of support provided by one's social network	$K = 2$
Social skills or functioning	The ability to interact with and relate to others in a way that follows social roles and promotes personal and interpersonal goals	$K = 13$
Relationship quality	Perceptions around the quality of key relationships, such as whether a relationship is characterised by closeness or conflict	$K = 2$
Social cognitions	Mental processes involved in understanding, interpreting, and responding to social information related to interpersonal relationships, including social-related cognitive schemas (e.g. trust and betrayal) and neurocognitive processes (e.g. emotion recognition)	$K = 2$

Note: See supplementary materials for more information on definitions.

interpersonal functioning. Our primary time-point for the meta-analysis was post-treatment, even where other timepoints were reported. Heterogeneity of studies was reported using  $I^2$  statistic and prediction intervals (Higgins et al., 2003; Higgins et al., 2009). Here, >25% indicates low heterogeneity, >50% moderate heterogeneity, and >75% high heterogeneity (Higgins et al., 2003). We also assessed the likelihood of publication bias using visual inspection of a funnel plot, and statistical testing (Egger et al., 1997). As a final robustness check of our main meta-analysis, we performed a Leave-One-Out (LOO) sensitivity analysis (Viechtbauer, 2010). This analysis involved re-running the meta-analysis excluding each study in turn and examining the impact on the overall pooled effect size.

There were several instances where a single study reported more than one outcome (e.g. peer problems and pro-social behaviour from the SDQ), or more than one reporter on a single outcome (i.e. child and carer reporter). In these cases, we used the following decision tree to select the outcome: first we prioritised child self-report over carer or teacher report; next we prioritised measures of interpersonal or social problems as opposed to positive outcomes (e.g. on the SDQ: peer problems, instead of prosocial skills). In line with the Cochrane Handbook for Systematic reviews of interventions (Higgins & Green, 2011), we ran a sensitivity analysis where we aggregated effect sizes across outcomes and reporters for each study, and re-ran the meta-analysis using aggregate effect sizes. Here, we assumed inter-rater correlation between subscales to be  $r = .35$  (Goodman, 2001). See supplementary materials for details on which subscale and reporter were used for each study included in the meta-analysis (Table S1).

### 1.5.2. Moderators

As per our pre-registration, we conducted exploratory sub-group analyses to identify possible sources of heterogeneity. *A priori* we decided to only investigate moderators where there were four or more studies in each group, and where this wasn't possible, to rerun

the meta-analysis, excluding the smaller group as a sensitivity analysis.

Moderators included: comparator (active vs passive), therapy format (group vs individual), and the extent to which caregivers were involved in therapy (some vs none). We were unable to examine therapy type (EMDR vs tf-CBT) or country context (high income, vs low-middle income) as moderators, as there was not enough papers (i.e. didn't meet our criteria of more than four papers). As a sensitivity analysis, we excluded studies which used EMDR ( $k = 1$ ) or which were conducted in low-and-middle-income countries ( $k = 3$ ). We could not examine trauma type as a moderator (interpersonal vs non-interpersonal) as per pre-registration, because all studies included in the meta-analysis involved young people who had experienced interpersonal trauma. As per our pre-registration, we also conducted sensitivity analyses upon risk of bias results by omitting studies that are judged to be at high risk of bias and re-running the meta-analysis ( $k = 6$ ).

## 2. Results

### 2.1. Characteristics of included studies

The systematic search resulted in 792 studies (after duplicates were removed), of which 17 met our

**Table 3.** Study descriptives.

Characteristics	$K = 17$
Participant age	
Younger childhood (6–12)	5
Adolescents (13–17)	1
Young adulthood (18–25)	1
Broad age range (6–25)	9
Participant gender/sex	
Girl only	3
Mixed	14
Setting	
Healthcare clinic	10
Community/support centre	3
Education setting	4
Country Context	
Low-middle income country	4
High income country	13

Note: This table includes all studies which met inclusion criteria, of which 13 were meta-analysed.

inclusion criteria (see Table 3 for study descriptives). The included studies represent a total of 2498 young people, with a mean age of 13. In nearly all studies, participants had been exposed multiple types of trauma (e.g. physical and sexual abuse, or sexual abuse and war-related conflict;  $k = 16$ ). One study included a sample of single-incident non-interpersonal trauma (e.g. car accidents; Meiser-Stedman et al., 2017).

Nearly all included studies implemented a type of trauma-focussed cognitive behavioural therapy ( $k = 16$ ; only Jamshidi et al., 2021 used EMDR). In all cases, therapy was delivered in person (as opposed to remotely), usually in individual format ( $k = 11$ ). Most interventions included some caregiver involvement ( $k = 15$ ), usually with a mixture of parallel and conjoint sessions. Study design varied: 10 used a passive waiting list control condition, four used treatment-as-usual, and three used an active control. See Table 4 for more detail on study design (see also supplementary materials; Tables S2 and S3).

Outcome measures predominantly assessed self, or caregiver reported social skills, functioning, or competency ( $k = 13$ ), with fewer focusing on perceptions of support ( $k = 2$ ), relationship characteristics ( $k = 2$ ), or social cognitions ( $k = 2$ ).

## 2.2. Narrative synthesis

Two studies investigated perceptions of the amount of social support available. With 156 participants, Birke-land et al. (2020) found that the children (aged 10–18) in the tf-CBT group reported higher perceived social support post-intervention than the treatment as usual group ( $t(154) = 2.98$ ,  $p < .05$ ,  $d = 0.47$ ). This effect was maintained at 12-month follow-up ( $t(154) = 2.2$ ,  $p = .028$ ,  $d = 0.47$ ), but not 18-month follow-up ( $t = 1.448$ ,  $p > .5$ ,  $d = 0.18$ ). By contrast, with a sample of 26 children (aged 8–17), Meiser-Stedman et al. (2017) did not find evidence of a difference in child-reported perceptions of social support post-intervention ( $F(1,25) = .32$ ,  $p > .05$ ,  $n_p^2 = 0.01$ ).

Two studies investigated changes in social cognitions. With a sample of 32 children (aged 8–13), Celano et al. (1996) reported that there was no difference in child-reported betrayal social cognitions between conditions following intervention (statistics unreported). Whereas Cohen (2004) found a significant group by time effect of tf-CBT upon child-reported social cognitions related to trust ( $n = 183$ ,  $F(1,182) = 5.34$ ,  $p < .01$ ,  $d = 0.34$ ), whereby post-intervention mistrust decreased more for the tf-CBT group (total sample aged 8–14 years old).

Two studies examined differences in carer-child relationship characteristics. With a sample of 85 young people (aged 14–21), Rimane et al. (2021) examined differences in child-reported attachment style (anxious attachment and avoidant attachment).

They did not analyse between group differences post-intervention, but did find that from pre- to post-intervention there was a significant decrease in child-reported anxious attachment style in both the tf-CBT group ( $t(26) = 1.51$ ,  $p < .05$ ,  $d = 0.29$ ), and the wait-list control ( $t(29) = 2.55$ ,  $p = .016$ ,  $d = 0.47$ ). They also reported that pre- to post-intervention there was a significant decrease in child-reported avoidant attachment style in the tf-CBT group ( $t(26) = 2.57$ ,  $p = .016$ ,  $d = 0.49$ ), but not the wait-list control ( $t(29) = 0.34$ ,  $p > .05$ ,  $d = 0.06$ ). The same pattern of results was reported at 3-month follow-up.

Finally, Dorsey et al. (2020) reported upon changes in parent-reported closeness between parents and children, as well as the amount of conflict they experienced with each other. They examined these outcomes in four different samples (aged 7–13) who received tf-CBT, two in Kenya (urban and rural), and two in Tanzania (urban and rural). They found significant differences in ‘closeness’ between the intervention group and treatment-as-usual group post-intervention for both Kenya samples (urban:  $t = 2.64$   $p < .05$ ,  $d = 0.27$ ; rural:  $t = 3.68$ ,  $p < .01$ ,  $d = 0.46$ ), but neither of the Tanzania samples (urban:  $t = 2.45$ ,  $p > .05$ ,  $d = 0.25$ ; rural:  $t = 2$ ,  $p > .05$ ,  $d = 0.25$ ). This was not the case for conflict, whereby the only group difference was for the Kenya Urban sample, but not the other groups ( $t = 2.73$ ,  $p < .05$ ,  $d = 0.28$ ).

In sum, of the six studies narratively reviewed, four of them reported small-medium improvements in social domain outcomes for young people who have received an evidence-based PTSD treatment.

## 2.3. Meta-analyses

The meta-analysis included 13 studies. These were studies that measured social skills or functioning, usually using the SDQ or CBCL. For 7 of the 13 we extracted child self-report. For the 6 where this was not available, we used caregiver ( $k = 5$ ) or teacher report ( $k = 1$ ).

There was a small but non-significant effect favouring the evidence-based treatment versus comparison ( $g = .20$ , 95% CI  $[-0.03, 0.44]$ ,  $p = .09$ ; see Table 5; see forest plot in Figure 2). While there was moderate heterogeneity according to  $I^2$ , inspection of prediction intervals suggested that the range of effects that might be observed in clinical practice would actually be quite narrow (95% PI  $[-0.49, 0.90]$ ). Inspection of the funnel plot was symmetrical, indicating that there was unlikely to be publication bias (see Figure 3). The Leave-One-Out sensitivity analysis revealed that the overall meta-analysis effect size remained mostly consistent across all studies, with no single study having a disproportionate influence on the results (ranging from 0.1452 to 0.2396, with confidence intervals spanning from  $[-0.0740, 0.4759]$ ).



**Table 4.** Study design information.

Trial paper(s)	Country	Sample size	Sample age	Ethnicity/Nationality (n, %)	Gender/sex (n, %)	Intervention manual	Control Condition	Outcomes	Risk of Bias <sup>c</sup>
Birkeland et al. (2020) and Jensen et al. (2014) <sup>a,d</sup>	Norway	n = 156	M = 15.1, SD = 2.2; (range 10–18)	Norwegian (115, 73.7%); Asian (17, 10.9%); one Norwegian parent (13, 8.3%); other (11, 7.1%)	f = 124, 79.5%; m = 32, 20.5%	Trauma-Focussed Cognitive Behavioural Therapy (Cohen et al., 2006)	TAU	Social skills (peer problems and pro-social behaviour subscale of SDQ) Perceptions of social support (FSSQ) Social Cognitions (Betrayal Subscale of CITES-R)	Some concerns
Celano et al. (1996)	United States of America	n = 32	M = 10.5, SD unreported (range: 8–13)	African American (24, 75%), White (7, 22%), Hispanic (1, 3%)	f = 32, 100%	Recovering from Abuse Programme (Celano et al., 1991)	TAU	Social Cognitions (Betrayal Subscale of CITES-R)	High
Cohen (2004) <sup>d</sup>	United States of America	n = 229	M = 10.76, SD unreported (range: 8–14)	White (122, 60%); African American (56, 28%); biracial (14, 7%); other (11, 5%)	f = 160, 79%; m = 43, 21%	Trauma-Focussed Cognitive Behavioural Therapy (Cohen & Mannarino, 2000)	AC	Social skills (social competency of CBCL) Social Cognitions (CAPS)	Some concerns
Cohen et al. (2005) <sup>a,d</sup>	United States of America	n = 82	M = 11.1, SD unreported (range: 8–15)	White (49, 60%); African American (30, 37%); other (3, 3%)	f = 56, 68%; m = 26, 32%	Sexual Abuse-Specific Therapy	AC	Social skills (social competency subscale of CBCL)	High
Dorsey et al. (2020) <sup>b</sup>	Kenya and Tanzania	All samples n = 320	Kenya Urban: M = 10.7, SD = 1.6 (range 7–13) Kenya Rural: M = 10.2, SD = 1.7 (range 7–13) Tanzania Urban: M = 10.9, SD = 1.6 (range 7–13) Tanzania Rural: M = 10.5, SD = 1.8 (range 7–13)	Unreported	Kenya, Urban: f = 96, 50%; m = 96, 50% Kenya, Rural: f = 64, 50%; m = 64, 50% Tanzania, Urban: f = 96, 50%; m = 96, 50% Tanzania, Rural: f = 64, 50%; m = 64, 50%	Trauma-Focussed Cognitive Behavioural Therapy (Cohen et al., 2006)	TAU	Relationship Characteristics (closeness and conflict subscales of the C-PRS)	Some concerns
Ehnholt et al. (2005) <sup>d</sup>	United Kingdom	n = 26	M = 12.9, SD = 0.93; (range: 11–15)	Albanian (11, 42%); Sierra Leone (10, 38%); Turkey (3, 12%); Afghanistan (1, 4%); Somalia (1, 4%)	f = 17, 65%; m = 9, 35%	Children and War: Teaching Recovery Techniques (Smith et al., 2000)	WL	Social skills (peer problems and pro-social behaviour subscale of SDQ)	High
Goldbeck et al. (2016) <sup>d</sup>	Germany	n = 159	M = 13.03, SD = 2.80; (range: 7–17)	German native (143, 89.9%); non-German native (11, 6.9%); missing (5, 3.1%)	f = 114, 71.7%; m = 45, 28.3%	Trauma-Focussed Cognitive Behavioural Therapy (Cohen et al., 2006)	WL	Social skills (social problems subscale of CBCL)	Low
Jamshidi et al. (2021) <sup>d</sup>	Iran	n = 30	M = 21.4, SD = 3.96; (range: 18–30)	Unreported	f = 30 (100%)	Eye movement desensitisation and reprocessing (EMDR) therapy (Shapiro 2017)	WL	Social skills (interpersonal problems subscale of CMS)	High
Kameoka et al. (2020) <sup>d</sup>	Japan	n = 30	M = 13.90, SD unreported (range: 11–13)	Unreported	f = 22, 73%; m = 8, 27%	Trauma-Focussed Cognitive Behavioural Therapy (Cohen et al., 2017)	TAU	Social skills (social problems subscale of CBCL)	Some concerns

Langley et al. (2015) <sup>d</sup>	United States of America	n = 74	M = 7.65, SD = 1.36; (range: 7–13)	Latino (36, 49%), Caucasian (20, 27%), African American (13, 18%), mixed ethnicity (4, 5%), Asian (1, 1%)	f = 37, 50%; m = 37, 50%	Bounce Back (Langley et al., 2015)	WL	Social skills (peer problems and pro-social behaviour subscale of SDQ and SAS-SR-Y)	High
Meiser-Stedman et al. (2017)	England	n = 29	M = 13.3, SD = 2.5; (range: 8–17)	White British (25, 86.2%), minority ethnicity (4, 13.8%)	f = 21, 72%, m = 8, 28%	Cognitive Therapy for Post-traumatic Stress Disorder (Smith et al., 2010)	WL	Social support perceptions (MSPSS)	Some concerns
O'Callaghan et al. (2013) <sup>d</sup>	Democratic Republic of Congo	n = 52	Experimental condition Mean = 15.83, SD = 1.27; control condition mean = 16.18, SD = 1.34; (range: 12–17)	Unreported	f = 52 (100%); m = 0 (0%)	Culturally adapted group Focussed Cognitive Behavioural Therapy (Cohen et al., 2006)	WL	Social skills (AYPA)	Some concerns
O'Callaghan et al. (2015) <sup>d</sup>	Democratic Republic of Congo	n = 50	M = 14.9, SD unreported (range: 8–17)	Unreported	f = 21, m = 29	Culturally adapted group therapy based upon Trauma-Focussed Cognitive Behavioural Therapy (Cohen et al., 2006)	AC	Social skills (AYPA)	Low
Ooi et al. (2016) <sup>d</sup>	Australia	n = 82	Experimental condition mean = 13.13, SD = 1.50; control condition mean = 12.05, SD = 1.75; (range: 10–17)	Exp group: African (27, 60%), Asian (5, 11%), Middle Eastern (9, 20%), Control group: African (19, 51%), Asian (13, 35%), Middle Eastern (5, 14%)	f = 29, 35%, m = 53, 65%	Children and War: Teaching Recovery Techniques (Smith et al., 2000)	WL	Social skills (prosocial behaviour subscale of SDQ)	Some concerns
Peltonen & kangaslampi, 2019 <sup>e</sup>	Finland	n = 50	M = 13.2, SD = 3.2; (range: 9–17)	Finnish (13, 26%), Iraq (14, 28%), Afghanistan (14, 28%), other (9, 18%)	f = 21, 42%, m = 29, 58%	Narrative Exposure Therapy (Schauer et al., 2011)	TAU	Social skills (peer problems and pro-social behaviour subscale of SDQ)	High
Rimane et al. (2021) <sup>a</sup>	Germany	n = 85	M = 18.14, SD = 2.23; (range: 14–21)	German citizen: n = 64 (75%); immigration background: n = 21 (25%)	f = 72, 85%, m = 13, 15%	Developmentally adapted Cognitive Processing Therapy (Matulis et al., 2014)	WL	Relationship characteristics (anxious and avoidant attachment of ECR-R)	High
Santiago et al. (2018) <sup>d</sup>	United States of America	n = 52	M = 7.76, SD = 0.88; (range: 6–10)	Latino 29 (55.8%), Latino/Caucasian 12 (23.1%), Latino/Native American 3 (5.9%), White/Caucasian 3 (5.9%), African American/Black 2 (3.8%), Missing Data 3 (5.9%)	f = 19, 36.5%, m = 33, 64.5%	Bounce Back (Langley et al., 2015)	WL	Social skills (peer problems and pro-social behaviour subscale of SDQ)	High

Notes: AC = active control; AYPA = African Youth Psychosocial Assessment Instrument (Bolton et al., 2007); CAPS = Children's Attributions and Perceptions Scale (Mannarino et al., 1994); CITES-R = Betrayal subscale of the Children's Impact of Traumatic Events Scales-Revised (Wolfe et al., 1991); CMS = Civilian Mississippi Scale for PTSD (CMS; Keane et al., 1990); C-PRS = Child-Parent Relationship Scale (Pianta, 1992); ECR-R = Experiences in Close Relationships Revised (Fraley & Shaver, 2000; German version, Ehrental et al., 2009); FSSQ = Duke-UNC functional social support questionnaire (Broadhead et al., 1988); MSPSS = Multidimensional Scale of Perceived Social Support (Zimet et al., 1988); SDQ = Strengths and Difficulties Questionnaire (Goodman, 2001); SAS-SR-Y = Social Adjustment Scale – Self-report for Youth (Weissman et al., 1980); TAU = treatment as usual; WL = wait-list control.

<sup>a</sup>Secondary data analysis of a trial reported elsewhere.

<sup>b</sup>Reports findings based upon four different samples within the same paper.

<sup>c</sup>Based upon the Cochrane Risk of Bias tool for Randomised Controlled Trials.

<sup>d</sup>Study included in meta-analysis.

**Table 5.** Results of random-effects meta-analysis.

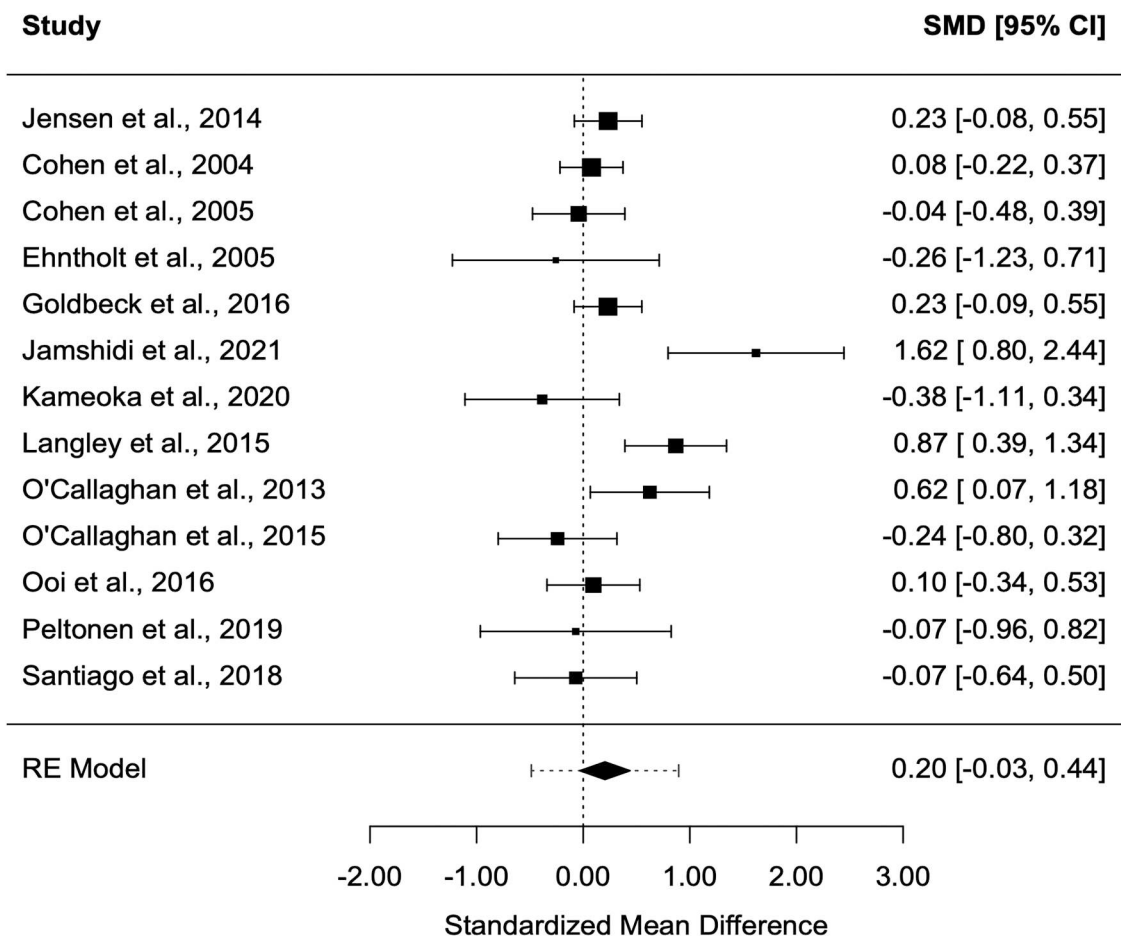
Analysis	<i>K</i>	<i>n</i>	Hedge's <i>g</i>	<i>I</i> <sup>2</sup>	95% CI	95% PI	<i>Q</i> (df)		
Main meta-analysis	13	986	0.204	65.7%	−0.031, 0.439	−0.487, 0.895	30.29(12)**		
Aggregate meta-analysis	13	986	0.151	18.3%	0.020, 0.282	−0.086, 0.388	23.73(12)*		
<b>Sensitivity analyses</b>									
Risk of bias <sup>a</sup>	7	698	0.145	0.01%	−0.004, 0.294	−0.005, 0.294	7.58(6)		
tf-CBT only <sup>b</sup>	12	938	0.145	40.9%	−0.034, 0.324	−0.275, 0.565	18.5(11)		
High income countries <sup>c</sup>	10	836	0.143	32.3%	−0.033, 0.312	−0.210, 0.496	12.6(9)		
<b>Moderators</b>									
	<i>K</i>	<i>n</i>	Hedge's <i>g</i>		95% CI		<i>Q</i> (df)	<i>Q</i>	<i>p</i>
Comparator							26.45(11)**	1.88	.171
Active	5	482	0.021		−0.325, 0.366				
Passive	8	486	0.319		−0.137, 0.776				
Care-giver involvement							29.99(11)**	0.36	.556
None	4	149	0.340		−0.175, 0.855				
Some	9	819	−0.176		−0.764, 0.411				
Therapy format							29.91(11)**	0.00	.953
Group	6	322	0.213		−0.166, 0.592				
Individual	7	646	−0.02		−0.523, 0.493				

<sup>a</sup>Only studies which did not have a high risk of bias.

<sup>b</sup>Only studies which used tf-CBT therapy.

<sup>c</sup>Only studies which were conducted in a high-income country.

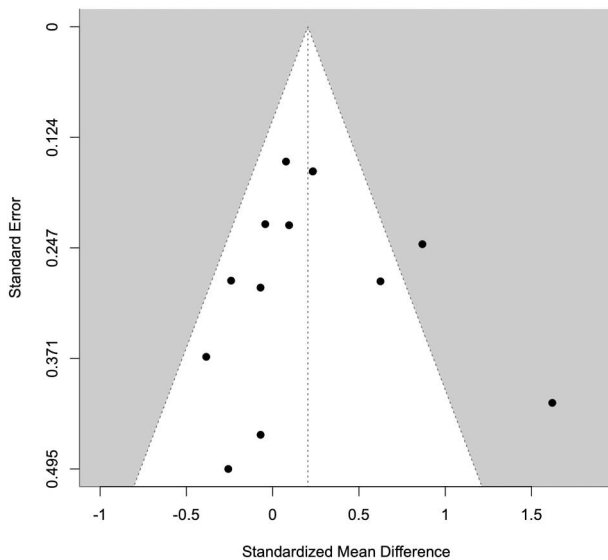
\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Figure 2.** Forest plot of main analysis.

As a sensitivity analysis, we re-ran the meta-analysis, but with aggregated effect sizes for studies which included multiple outcomes (e.g. multiple reporters on SDQ). This revealed a similar pattern, whereby social functioning scores were higher post-treatment versus control, with a small effect size that here

reached statistical significance ( $g = .15$ , 95% CI [0.02, 0.28],  $p = .02$ ; see Supplement 6 for forest plot).

We examined three moderators (control type, care-giver involvement, therapy format). None were found to moderate post-treatment effects (see Table 5). The pooled effect size for studies using an active control



**Figure 3.** Funnel plot of main analysis.

was comparable to passive controls ( $Q = .187, p = .17$ ), as were studies with and without care-giver involvement ( $Q = .345, p = .56$ ), and studies which conducted individual and group therapy ( $Q = .003, p = .95$ ).

As a final series of sensitivity checks, we removed studies which were indicated as having a high risk of bias ( $k = 6$  removed), which left seven studies. Again, this indicated a small benefit of the evidence-based intervention over the control condition on social skills ( $g = .14, 95\% \text{ CI } [.00, 0.29]$ ). We found similar results when we removed the one study which used EMDR (as opposed to tf-CBT;  $g = .15, 95\% \text{ CI } [.00, 0.32]$ ), and when we examined studies which were conducted in high-income countries only ( $g = .14, 95\% \text{ CI } [-.03, 0.32]$ ).

### 3. Discussion

Given evidence that social domains (e.g. perceived support, peer or relationship difficulties) might be reciprocally associated with child PTSD, we sought to understand whether best-evidenced psychological treatments would lead to improvements in these domains. Our meta-analytic analysis found only limited evidence of small (non-significant) effects favouring tf-CBT/EMDR over control conditions upon social and interpersonal outcomes. There was substantial variability across trials, and this variability was not explained by the moderators investigated, including type of control condition, therapy type, caregiver-involvement, or country context. We narratively synthesised research on broader social domains, including perceptions of support, social cognitions, and relationship characteristics. Of the six studies reviewed, four of them reported small-medium improvements in social domain outcomes for young people who have received an evidence-based PTSD treatment.

Interpersonal and social domains are not central to the theories that underlie tf-CBT, or EMDR, and they are also not a specific target of these treatments. Despite this, a recent review of the adult literature indicated medium-sized positive effect of best-evidenced trauma-focussed therapies upon interpersonal functioning (Swerdlow et al., 2023). Our review somewhat contradicts this study, finding only a small positive effect upon social functioning. There are several reasons why this might be the case. Firstly, multiple potential sources of heterogeneity were identified, including assessment approach (e.g. teacher, parent or youth ratings), treatment arms (e.g. treatment manual and format) and differences in the specific social and interpersonal outcome measures (e.g. SDQ and CBCL). Secondly, children have less autonomy over their social lives (i.e. they attend school, after school clubs). Whilst adults may choose to socialise more following therapy, which might have positive knock-on effects for social and interpersonal outcomes, the social landscape of a child is less likely to change after child-focussed therapy. It may be that in order to improve social domains in children and adolescents with PTSD, we need to include therapeutic exercises which directly target social-related processes. This was included amongst the implications of two other recent narrative reviews, but in relation to children and young people with anxiety disorders, or who were institutionalised in a mental health hospital (Etkin et al., 2023; Wright et al., 2019). Finally, though we only found a small difference in social domains after evidence-based therapy for PTSD, it is also important to consider whether this small difference is tangible and meaningful for the young person (Carey et al., 2023).

One tentative implication of this review is that our best-evidenced trauma-focussed therapies for PTSD in children and young people do not appear to affect change upon PTSD scores due to substantial changes in social and interpersonal domains. By this we mean that PTSD symptomatology was improved for children and young people in the trials included, regardless of its small effect upon social and interpersonal domains. This supports cognitive models of PTSD, which implicate the importance of other psychological processes, such as trauma appraisals and avoidance (Ehlers & Clark, 2000). That said, this review reveals that young people may continue to have challenges with social functioning, or continue to feel that they do not have adequate support despite undergoing therapy.

We only identified 17 studies which reported social-related outcomes, which is a small proportion of all the treatment trials which have been conducted upon children and young people with PTSD. Qualitative research and national surveys show that children and young people report that friendships and

relationships are very important for wellbeing and mental health problems, including within trauma-exposed samples (Briheim-Crookall et al., 2020; Children's Commissioner, 2017). Now that there is a strong evidence-base for tf-CBT, and to some extent EMDR (Bastien et al., 2020; Davis et al., 2023; Leenarts et al., 2013; Mavranouzouli et al., 2020), research should direct attention to secondary outcomes which are frequently reported to be important to young people and adolescents with PTSD.

Of note, most studies included in this review focussed upon social functioning outcomes (specifically, peer problems and prosocial behaviour). Few focused on perceptions of social support (Cohen & Wills, 1985; McLaughlin et al., 2020). Similarly, socially relevant neurocognitive processes (e.g. threat perception, emotion recognition), which are evidenced mechanisms for multiple mental health conditions including PTSD in trauma-exposed samples, were not studied at all in relation to treatment effect (McCrory & Viding, 2015). Future research should explore how negative and unsupportive responses from parents or carers might impact outcomes. Observational studies indicate that parental response to trauma is crucial for the development of PTSD (e.g. Afzal et al., 2023). This area, particularly in parent/carer-led PTSD interventions, has not been adequately explored and warrants further investigation. Additionally, since individuals who experienced childhood maltreatment face increased risks of revictimisation, such as bullying and intimate partner violence (e.g. Li et al., 2019), understanding the impact of PTSD treatments on these social outcomes is essential, yet under-researched.

Future trials might consider investigating social and interpersonal outcomes with greater specificity, for example examining interplay between improvement in PTSD symptoms, social functioning, social cognitions and socially relevant neurocognitive processes. Indeed, it is likely that these social and interpersonal domains are related and overlapping, but more work is needed to understand how they interact, especially as a mechanism for mental health. Work of this kind has the potential to improve our understanding of mechanisms for PTSD development, maintenance, and treatment.

Findings should be taken in view of several limitations, most of which relate the studies included. The overall number of studies included was small, and several of the samples were relatively small (i.e. more than half had around 50 participants or less). This likely reflects the challenge with conducting research with children and young people with complex mental health difficulties, in complex settings. There was good diversity in terms of sample demographics, with studies conducted with in high and low-middle-income countries, though there

was a slight trend towards more females than in males. As reflected in the risk-of-bias assessments, many of the included studies were at risk of some bias. Though moderator analyses indicated that this likely did not impact upon findings, this should be addressed in future research. Our group-level findings may also mask considerable between-person variability in treatment outcomes. It may be that social support was improved for some young people, under certain circumstances, and this warrants further investigation. For example, how might baseline social support scores relate to changes after treatment? Finally, it may be that some of the studies are impacted by floor or ceiling effects. At baseline, several studies reported low problem scores (e.g. on peer problems), meaning there was little room for positive improvement during the trial. This may represent a problem with sample recruitment, whereby young people who have poor social functioning do not partake in treatment trials. This issue should be examined in future research.

This review investigated the utility of tf-CBT and EMDR in improving interpersonal and social domains for children and young people with PTSD. In sum, only a few trials reported on social and interpersonal outcomes, and where they are reported the evidence is mixed. There was little evidence that young people experience improvements in their social functioning across the small number of trials included. It may be that trauma-focused therapies for PTSD need to be adapted in some circumstances, so that they address social and interpersonal deficits. To move the field forward, investigations should investigate social and interpersonal domains with greater specificity, taking a theory-driven approach, to further our understanding of the link between PTSD, social support and interpersonal functioning.

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## Data availability statement

Data are available upon request to the corresponding author.

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