REVIEW

Evidence-based treatments for children with trauma-related psychopathology as a result of childhood maltreatment: a systematic review

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Abstract This is a systematic review of evidence-based treatments for children exposed to childhood maltreatment. Because exposure to childhood maltreatment has been associated with a broad range of trauma-related psychopathology (e.g., PTSD, anxiety, suicidal ideation, substance abuse) and with aggressive and violent behavior, this review describes psychotherapeutic treatments which focus on former broad range of psychopathological outcomes. A total of 26 randomized controlled clinical trials and seven non-randomized controlled clinical trials published between 2000 and 2012 satisfied the inclusionary criteria and were included. These studies dealt with various kinds of samples, from sexually abused and maltreated children in child psychiatric outpatient clinics or in foster care to traumatized incarcerated boys. A total of 27 studies evaluated psychotherapeutic treatments which used trauma-focused cognitive, behavioral or cognitive-behavioral techniques; only two studies evaluated trauma-specific treatments for children and adolescents with comorbid aggressive or violent behavior; and four studies evaluated psychotherapeutic treatments that predominantly focused on other mental health problems than PTSD and used non-trauma focused cognitive, behavioral or cognitive-behavioral techniques. The results of this review suggest that trauma-focused cognitive-behavioral therapy (TF-CBT) is the best-supported treatment for children following childhood maltreatment. However, in line with increased interest in the diagnosis of complex PTSD and given the likely relationship between childhood maltreatment and aggressive and violent behavior, the authors suggest that clinical practice should address a phase-oriented approach. This review concludes with a discussion of future research directions and limitations.

Keywords Child · Posttraumatic stress disorder · Treatment · Maltreatment · Aggressive behavior · Trauma-related psychopathology

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Introduction

Numerous epidemiological studies demonstrate that children are exposed to high rates of childhood maltreatment. According to official reports from child protection organizations, about 4 % of children in the United States of America (USA) have experienced childhood maltreatment [62]. Some national surveys in the USA show even higher rates. For example, according to Finkelhor et al. [26] about 10 % of a nationally representative sample ($N = 4549$) had experienced some form of childhood maltreatment. In

Europe prevalence rates are high as well. For example, the results of a British national survey among 2,869 young adults, which was a representative sample of the total British population of 18–24 year olds, demonstrated that severe maltreatment was experienced by 16 % of the sample [49]; in the Netherlands, according to official reports from child protection organizations, 3.4 % of all children have experienced childhood maltreatment [5]. In the past 20 years, the dramatic impact of childhood maltreatment on children's mental health has been investigated extensively [18, 67]. There is now clear evidence that physical, emotional and sexual abuse and physical and emotional neglect are associated with an increased prevalence of mental health problems such as anxiety, posttraumatic stress, depression, suicidal ideation and substance abuse [40, 59, 75]. Moreover, an extensive body of research has documented that chronic childhood maltreatment is associated with complex posttraumatic stress disorder (complex PTSD). Complex PTSD attempts to tackle the symptoms that not only incorporate, but also extend beyond DSM defined posttraumatic stress symptoms, and reflects disturbances predominantly in affective and interpersonal self-regulatory capacities [10, 17, 33]. In addition, chronic childhood maltreatment has been associated with aggressive and violent behavior [25, 54] and with a risk of developing a variety of personality disorders [46]. The negative consequences of chronic childhood maltreatment may also increase the potential for revictimization [27]. Revictimization theories point out that children with maltreatment histories may be at high risk of being maltreated again because they may tolerate excuses for abuse [37], be more vulnerable to negative peer influences [44], or may have difficulties surrounding control, trust and boundaries [9]. Furthermore, chronic childhood maltreatment is associated with health and mental health services use [79] and child welfare and juvenile justice system involvement [1].

Previous findings called for specific and evidence-based interventions for such children. Several reviews demonstrated that a number of psychotherapeutic adult treatment methods have been adapted for children to reduce posttraumatic stress symptoms [64, 67, 77]. In addition, these reviews aimed at systematically evaluating treatment programs which focus on the direct negative psychological impact of childhood maltreatment such as posttraumatic stress disorder (PTSD). Those reviews have not focused on the broad range of psychopathological outcomes, which have been proposed to be the result of chronic childhood maltreatment. Therefore, the objective of the present review was to systematically evaluate psychotherapeutic treatments for children exposed to childhood maltreatment and to describe treatments which focus on the above mentioned broad range of psychopathological outcomes.

Methods

Search strategy

A systematic search was performed in the following electronic databases: PsycINFO, via CSA Illumina; PubMed; EMBASE.com; CENTRAL, via the Cochrane Library, Wiley; and PILOTS, via CSA Illumina. Each database was searched for articles in peer-reviewed journals from inception to 26 July 2012. A librarian (EPJ) experienced in conducting systematic reviews assisted with the formation of appropriate search terms for each of the above electronic databases.

Search terms included controlled terms from the Thesaurus in PsycINFO, MeSH in PubMed and EMtree in EMBASE.com as well as free text terms. Free text terms were used only in the databases CENTRAL and PILOTS. Search terms expressing trauma or psychological trauma in children aged 6–17 years were used in combination with search terms comprising treatment. Age limits were used in PsycINFO and a child filter in the other databases. In PsycINFO, PubMed and EMBASE.com, search results were limited by search terms indicating e.g., 'clinical trial', 'controlled', 'randomized', 'evaluation study' and 'review'.

The first (LEWL) and second (JD) author reviewed all titles and abstracts independently. If inclusion criteria were met based upon the title and abstract, full-text articles were assessed for eligibility. Disagreements were resolved by discussion between the two reviewers.

Criteria of inclusion

In order to be included in the systematic review, the study and the treatments had to meet the following predetermined criteria:

1. Only randomized and non-randomized controlled clinical trials were included. Since obvious difficulties exist of blinding participants and practitioners in psychotherapeutic treatment studies, studies did not have to be blinded to be included. No minimum sample size per treatment condition was required to be included. Single case studies were excluded. Only studies in the last decade were included.

2. Studies had to include children from 6 up to 18 years, who were exposed to childhood maltreatment. Studies in which the abusive or perpetrating parents were the sole recipients of treatment were only included, if PTSD or PTSD symptoms of the maltreated children were evaluated. In order to include studies on a homogeneous group; studies of children solely exposed to war related violence or traumatic grief,

and studies which included only children younger than the age of 6 years were excluded.

3. Studies had to evaluate psychotherapeutic treatments that described the use of cognitive-behavioral techniques, as there is a strong theoretical evidence supporting the use of cognitive-behavioral techniques in treating children with trauma-related psychopathology [8]. Studies focused on prevention were only included if childhood maltreated children or children at risk were included in the preventive treatment. In addition, studies with a combination of medication in the experimental group were only included if the effect of the psychotherapy could be addressed separately.

4. Studies with the following types of comparisons were included: comparison to a wait list group, delayed treatment, treatment as usual (TAU), other active psychotherapeutic treatments or no treatment. Pharmaceutical comparisons were excluded.

5. The studies had to assess PTSD or PTSD symptoms associated with childhood maltreatment.

Assessment of methodological quality

The Cochrane collaboration's tool for assessing risk of bias [34] was used to assess the quality of the included studies. Each item was judged on a three-point rating scale: 'low risk of bias', 'high risk of bias' or 'unclear risk of bias'. The scale addresses seven domains, namely: selection bias due to inadequate generation of a randomized sequence; selection bias due to inadequate concealment of allocations prior to assignment; performance bias due to prior knowledge of the allocated interventions by participants and personnel during the study; detection bias due to knowledge of the allocated interventions by outcome assessors; attrition bias due to amount, nature or handling of incomplete outcome data; reporting bias due to selective outcome reporting; and bias due to problems not covered in other issues [34]. The quality of studies was evaluated independently by the first (LEWL) and second (JD) author; disagreements were resolved in a consensus meeting of the two evaluators.

Results

The literature search generated a total of 17,077 references: 3,083 in PsycINFO, 4,450 in PubMed, 4,826 in EM-BASE.com, 3,486 in the Cochrane library and 1,232 in PILOTS. Duplicates that were selected from more than one database were removed. A total of 33 studies met the content-specific eligibility criteria. See Fig. 1 for search and selection flowchart.

In Table 1 the authors, country where the study was carried out, method of the study, participants, interventions, effect sizes for PTSD or PTSD symptoms and described limitations are presented. Table 2 shows the methodological quality of the included studies. Because childhood maltreatment may lead to a broad range of psychopathological outcomes (e.g., PTSD, anxiety, aggressive behavior, sleep problems), the studies are clustered into three clinical relevant categories which address this broad range of outcomes. It is important to note that the following three categories do not represent a certain rank order of the best treatment option for children exposed to chronic childhood maltreatment.

Trauma-specific treatments

Any psychotherapeutic treatment delivered individually or in a group setting that predominantly used trauma-focused
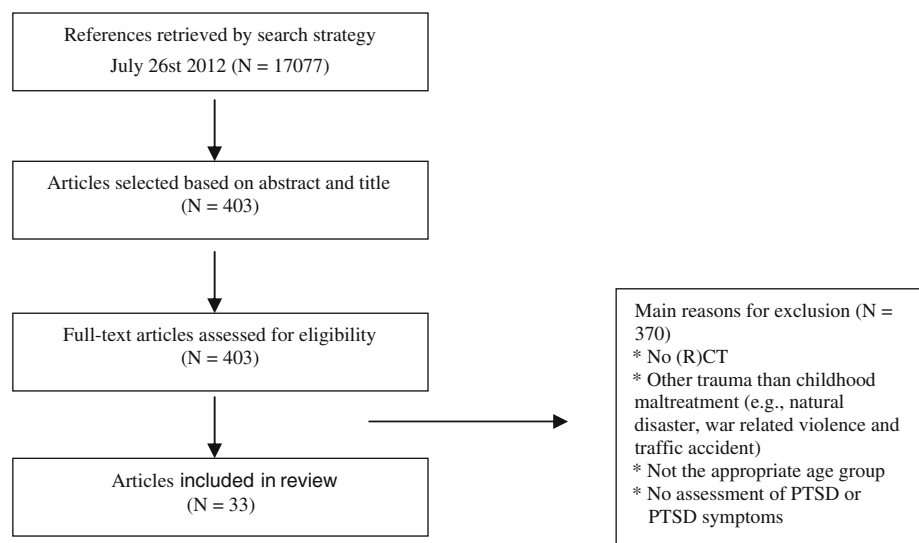

Fig. 1 Flowchart search and selection

References retrieved by search strategy
July 26st 2012 (N = 17077)

↓

Articles selected based on abstract and title
(N = 403)

↓

Full-text articles assessed for eligibility
(N = 403)

↓

Articles included in review
(N = 33)

→ Main reasons for exclusion (N = 370)
* No (R)CT
* Other trauma than childhood maltreatment (e.g., natural disaster, war related violence and traffic accident)
* Not the appropriate age group
* No assessment of PTSD or PTSD symptoms

Table 1 Overview of studies included in review

Study and method	Included participants	Interventions	Effect sizes for PTSD or PTSD symptoms	Described limitations
1. Ahmad et al. [2] Sweden RCT	Maltreated or sexually abused children; children who had a road accident, witnessed unnatural death or other types of trauma 33 randomized 6–16 years old 39 % male	Eye Movement Desensitization and Reprocessing (EMDR) WLC	PTSS-C: 0.08 (between group, posttest)	Small and highly selected sample size Post-treatment evaluation only conducted with one assessment instrument Subjects belong to heterogeneous groups with different psychological backgrounds Lack of independent verification of treatment fidelity and follow-up evaluation of treatment effects
2. Ahrens and Rexford [4] USA RCT	Traumatized incarcerated boys 38 randomized 15–18 years old 100 % male	Cognitive Processing Therapy (CPT) WLC	PSS-SR: 1.23 (between group, posttest) IES: 1.53 (between group, posttest)	Small sample size Prevalence of comorbid diagnoses along with PTSD among population may have complicated treatment process Use of self-report questionnaires and adult measures Principal investigator provided treatment
3. Berkowitz et al. [7] USA RCT	Sexually abused children; children confronted with violence; children confronted with motor vehicle, accident, injuries or animal bite 106 randomized 7–17 years old 48 % male	Child and Family Traumatic Stress Intervention (CFTSI) Supportive comparison group	TSCC (PTSD subscale): 0.32 (between group, posttest)	Relatively high dropout rate The study did not evaluate which elements of the experimental treatment were essential therapeutic mechanisms Study participants experienced a wide variety of trauma types One measure was used for intervention and outcome measure
4. Cohen et al. [13] USA RCT	Sexually abused children 229 randomized 8–14 years old 21 % male (attended ≥3 treatment sessions)	Trauma-Focused Cognitive-Behavioral Therapy (TF-CBT) Child-Centered Therapy (CCT)	K-SADS-PL (PTSD supplement, re-experiencing): 0.49 (between group, posttest) K-SADS-PL (PTSD supplement, avoidance): 0.70 (between group, posttest) K-SADS-PL (PTSD supplement, hyper-vigilance): 0.40 (between group, posttest)	Lack of no treatment control group Study did not elucidate which specific TF-CBT components underlie its superior effectiveness Relatively little ethnic diversity in sample
5. Cohen et al. [14] USA RCT	Sexually abused children 82 randomized 8–15 years old 32 % male	TF-CBT Non-directive supportive therapy (NST)	TSCC (PTSD subscale): 0.22 (between group, posttest)	Insufficient sensitivity of the instrument used to measure PTSD Relatively high dropout rate
6. Cohen et al. [16] USA RCT	Children exposed to intimate partner violence 124 randomized 7–14 years old 49 % male	TF-CBT CCT	–	Relatively high dropout rate Participants experienced ongoing trauma exposure or contact with perpetrator during treatment Treatment was abbreviated Lack of a no-treatment control group Results are not generalizable to settings that lack additional services

Table 1 continued

Study and method	Included participants	Interventions	Effect sizes for PTSD or PTSD symptoms	Described limitations
7. Danielson et al. [20] USA RCT	Sexually assaulted children 30 randomized 13–17 years old 12 % male	Risk reduction through family therapy (RRFT) TAU	UCLA PTSD-A: 0.38 (between group, posttest)	Baseline differences between RRFT and TAU across most variables and treatment dosage differences Small sample size Unrestrictive inclusion criteria Heterogeneity within sample
8. Deblinger et al. [22] USA RCT	Sexually abused children 67 randomized 2–8 years old 39 % male	Cognitive-behavioral therapy (CBT) Supportive counseling	PTSD scale: 0.07 (between group, posttest)	Majority of sample did not demonstrate clinically significant behavior problems at pretreatment Ceiling and/or floor effects may explain lack of differential treatment effects Only 3 months follow-up Support group did not include parent–child work Lack of no treatment or WLC group
9. Deblinger et al. [24] USA RCT	Sexually abused children 210 randomized 4–11 years old 39 % male (completers)	TF-CBT with or without trauma-narrative (TN) component in eight versus 16 sessions	K-SADS-PL (PTSD supplement, re-experiencing): 0.35 (mean, between group, posttest) K-SADS-PL (PTSD supplement, avoidance): 0.35 (mean, between group, posttest) K-SADS-PL (PTSD supplement, hyper-vigilance): 0.23 (mean, between group, posttest)	Children assigned to all groups experienced some trauma exposure Relatively small cell sizes Results only generalizable to young children who have experienced child sexual abuse
10. Ford et al. [28] USA RCT	Girls involved in delinquency 59 randomized 13–17 years old 0 % male	Trauma affect regulation: guide for education and therapy (TARGET) enhanced treatment as usual (ETAU)	CAPS-CA: 0.24 (between group, posttest)	Small sample size Relatively high dropout rate All measures were self-report Assessor not blinded No comparison to a well-validated PTSD treatment Higher initial levels of PTSD symptoms (criterion B) in TARGET than in ETAU Participants lost at follow-up assessment Only girls included
11. Gilboa-Schechtman et al. [29] USA RCT	Sexually abused children; children confronted with motor vehicle accidents, nonsexual assaults, terrorist attacks or other types of trauma 38 randomized 12–18 years old 37 % male	Prolonged exposure therapy for adolescents (PE-A) Time Limited dynamic psychotherapy for adolescents (TLDP-A)	CPSS: 0.45 (between group, posttest)	Modest sample size Highly comorbid and heterogeneous sample
12. Haight et al. [32] USA RCT	Maltreated children in foster care 23 randomized 7–15 years old 60 % male (completers)	Life story intervention (LSI) WLC	–	Relatively high dropout rate Small sample size Caregivers were not blinded as to whether the child was receiving the intervention Focus on children already involved in the child welfare system

Table 1 continued

Study and method	Included participants	Interventions	Effect sizes for PTSD or PTSD symptoms	Described limitations
13. Jaberghaderi et al. [36] Iran RCT	Sexually abused girls 19 randomized 12–13 years old 0 % male	EMDR CBT	CROPS: 0.52 (between group, posttest)	Small sample size Impossible to distinguish therapist effects by using one therapist for each treatment group No procedures to evaluate treatment adherence Lack of no treatment control group Discrepancy of number of sessions between EMDR and CBT group Termination criteria may have biased results
14. Kataoka et al. [38] USA Quasi-experimental study	Community violence exposed children 229 randomized M = 11.4 (1.7) years old 50 % male	Mental Health for Immigrants Program (MHIP) WLC	CPSS: 0.25 (between group, posttest)	Symptom changes were modest and remained in clinical range at short-term follow-up Randomization of only a portion of the participants No comparison with alternative active treatment Drop out was high among specific group (older children) Unable to determine which component of the program contributed to its success
15. King et al. [41] USA RCT	Sexually abused children 36 randomized 5–17 years old 31 % male	Child CBT Family CBT WLC	PTSD section of ADIS: 0.23 (Child CBT/Family CBT, posttest) PTSD section of ADIS: 1.09 (Child CBT/WLC, posttest) PTSD section of ADIS: 1.24 (Family CBT/WLC, posttest)	Small sample size The WLC does not control for the requirement of characteristics of active treatments The measurements were carried out by the therapists Brief follow-up period
16. Krakow et al. [42] USA Non-randomized study with control group	Girls with complaints of nightmares or disturbing dreams who had suffered a high prevalence of unwanted sexual experiences 30 randomized 13–18 years old 0 % male	Imagery rehearsal therapy No treatment control group	PSS-SR: 0.57 (between group, posttest)	Small sample size Selective population Lack of randomization Use of some psychometric instruments nonstandardized (for adolescents) Only a 3 month follow-up
17. Lange and Ruwaard [43] The Netherlands Within-subject, baseline-controlled study	Sexually abused children 24 randomized 14–25 years old 4 % male	Therapist-assisted web-based treatment Placebo intervention	IES: 1.19 (between group, posttest)	Considerable pretreatment withdrawal Only 4 % male Absence of follow-up measurements
18. Lyshak-Stelzer et al. [47] USA RCT	Maltreated children; sexually abused children; children confronted with violence in the neighborhood, loss, war or a disaster; children confronted with serious medical problems, severe accidents or other types of traumas 86 randomized 13–18 years old 55 % male	Trauma-focused art-Therapy (TF-ART) TAU	UCLA PTSD reaction index: 1.69 (between group, posttest)	Participants were inpatients with relatively low IQs Small sample size Attrition was relatively high Although participants were randomized, it is possible that the greater efficacy of TF-ART is an artifact of attrition or other unrecognized variables Not able to conduct long-term follow-up assessments

Table 1 continued

Study and method	Included participants	Interventions	Effect sizes for PTSD or PTSD symptoms	Described limitations
19. Muris et al. [51] The Netherlands RCT	Children with anxiety disorders 36 randomized 8–13 years old 25 % male	Individual coping Koala CBT Group coping Koala CBT	SCARED-R (traumatic stress disorder subscale): 0.17 (between group, posttest)	Small sample size Nearly all participants Caucasian No follow-up No direct WLC
20. Najavits et al. [52] USA RCT	Maltreated girls; sexually abused girls; girls followed after disaster or accident; girls confronted with crime; all the participants met DSM-IV criteria for substance use disorder and PTSD 33 randomized M = 16.06 (1.22) years old 0 % male	Seeking safety (SS) TAU	TSCC (sexual concerns subscale): 0.81 (between group, posttest) TSCC (sexual distress subscale): 0.84 (between group, posttest)	Small sample size Greater level of psychopathology in TAU Only girls in sample Restriction to outpatients Missing data Multiple statistical testing No comparison to other manualized treatments
21. Pretorius and Pfeifer [53] South Africa Solomon four-group design	Sexually abused girls 25 randomized 8–11 years old 0 % male	Group art therapy No treatment control group	–	Small sample size Presence of confounding variables Only one therapist conducted the treatment program
22. Raider et al. [55] USA RCT	Maltreated children; children confronted with traumatic loss or separation 23 randomized 15–18 years old 61 % male	Trauma Intervention Program for Adjudicated and At-Risk Youth (SITCAP-ART) WLC	–	Small control group Size of treatment group modest
23. Rivard et al. [58] USA Non-randomized study with control group	Maltreated children; sexually abused children; children confronted with violence 158 randomized 12–20 years old 63 % male	Sanctuary model Standard residential service	–	–
24. Runyon et al. [60] USA RCT	Physically abused children 75 randomized 7–13 years old 53 % male (attended ≥3 treatment sessions)	Combined parent–child cognitive-behavioral therapy (CPC-CBT) Parent-only CBT	K-SADS-PL (PTSD total score): 0.60 (between group, posttest)	Small sample size Lack of complete follow-up data Relatively high dropout rate
25. Smith et al. [65] UK RCT	Children confronted with motor vehicle accident or interpersonal violence; children who witnessed violence 24 randomized 8–18 years old 50 % male	CBT WLC	CPSS: 2.48 (between group, posttest) C-RIES: 2.20 (between group, posttest) CAPS-CA: 1.59 (between group, posttest)	Small sample size Effectiveness of treatment not generalizable to youth presenting PTSD following multiple traumatic exposure
26. Soberman et al. [66] USA RCT, matched on different variables	Boys with conduct problems 29 randomized 10–16 years old 100 % male	Standard care + three sessions EMDR Standard care	–	No independent assessment of treatment fidelity available Use of single therapist for EMDR group Quality and quantity of measurements were limited Small sample size Treatment course too short

Table 1 continued

Study and method	Included participants	Interventions	Effect sizes for PTSD or PTSD symptoms	Described limitations
27. Stein et al. [68] USA RCT	Violence exposed children 126 randomized M = 11 (0.3) years old (CBITS); M = 10.9 (0.4) (WLC) 44 % male	Cognitive-behavioral intervention for trauma in schools (CBITS) WLC	–	No measurement of long-term effects No information about exposure to new violence No comparison with an alternative intervention None of the informants were blinded
28. Swenson et al. [69] USA RCT	Physically abused children 90 randomized 10–17 years old 44 % male	Child abuse and neglect (MST-CAN) Enhanced outpatient treatment (EOT) Systematic training for effective parenting of teens (STEP-TEEN)	–	Examination of multiple outcomes Small sample size Developer of MST-CAN was co-supervisor on the project, could limit generalizability of outcomes Unknown whether home visits provided by therapists increased or decreased likelihood of reabuse or its detection Completion rate of STEP-TEEN program was lower than for MST-CAN, which could have influenced outcomes Generalizability limited by race Due to self-report, underestimation of services received by families
29. Taussig and Culhane [70] USA RCT	Maltreated children in foster care 156 randomized 9–11 years old 51 % male	Fostering healthy futures (FHF) No treatment control group	TSCC (PTSD subscale): 0.12 (between group, posttest)	Differences on key variables at baseline between groups Those lost on follow-up had lower IQs and more mental health problems Variability in caregivers and teachers, knowledge of children's functioning varied
30. Tourigny and Hébert [72] Canada Non-randomized study with control group	Sexually abused girls (some of them also physically abused) 55 randomized 13–17 years old 0 % male	Open group therapy (Centre d' Intervention en Abus Sexuels pour la Famille (CIASF)) Closed group therapy (Centre d' Intervention en Abus Sexuels pour la Famille (CIASF)) No treatment control group	TSCC (total scale): 0.17 (open/closed, posttest) TSCC (total scale): 1.82 (open/control, posttest) TSCC (total scale): 1.74 (closed/control, posttest)	Use of a quasi-experimental design All measures based on self-reports
31. Trowell et al. [73] UK RCT	Sexually abused girls 75 randomized 6–14 years old 0 % male	Individual psychotherapy plus caregiver support Group psychotherapy plus caregiver support	Orvaschel's PTSD scale (extension of the K-SADS) (re-experience of traumatic event subscale): 0.60 (between group, 12 month follow-up) Orvaschel's PTSD scale (extension of the K-SADS) (persistent avoidance of stimuli subscale): 0.66 (between group, 12 month follow-up)	Lack of no treatment control group Small sample size Attrition level was higher than hoped Masking of subjects was impossible Results only generalizable to specific group

Table 1 continued

Study and method	Included participants	Interventions	Effect sizes for PTSD or PTSD symptoms	Described limitations
32. Weiner et al. [76] USA Evaluation of three evidence-based treatments	Maltreated children in foster care 133 randomized 3–18 years old 47 % male	TF-CBT Structured psychotherapy for adolescents responding to chronic stress (SPARCS) Child-parent psychotherapy (CPP)	CANS (traumatic stress symptoms): 0.47 (TF-CBT/CPP, posttest) CANS (traumatic stress symptoms): 0.29 (TF-CBT/SPARCS, posttest) CANS (traumatic stress symptoms): 0.20 (CPP/SPARCS, posttest)	–
33. Wolfe et al. [78] Canada RCT	At-risk children of abusive relationships based on a history of maltreatment 158 randomized 14–16 years old 50 % male	Youth relationships project (YRP) No treatment control group	–	Reliance on adolescent self-reports True random assignment compromised Unexplained variance Different numbers of assessment points (between participants)

The effect sizes for the total scores of the instruments are reported; if the instrument had no total score, the effect sizes for the subscales are reported. An effect size between 0.2 and 0.5 is small, between 0.5 and 0.8 is medium, and an effect size > than 0.8 is large [11]. Randomized controlled trial (RCT), wait list control (WLC), treatment as usual (TAU), posttraumatic stress symptom scale for children (PTSS-C), PTSD symptom scale self-report (PSS-SR), Impact of event scale (IES), trauma symptom checklist for children (TSCC), schedule for affective disorders and schizophrenia for school—age children present and lifetime version (K-SADS-PL), University of California at Los Angeles PTSD index for adolescents (UCLA PTSD-A), clinician administered PTSD scale for children and adolescents (CAPS-CA), child PTSD symptom scale (CPSS), child report of post-traumatic symptoms (CROPS), anxiety disorder interview schedule (ADIS), screen for child anxiety related emotional disorders (SCARED-R), children's revised impact of event scale (C-RIES), child and adolescent needs and strengths (CANS)

cognitive, behavioral or cognitive-behavioral techniques. In addition, these treatments could involve exposure to the traumatic event; exposure can be implemented by applying techniques such as direct discussion, imagining or visualization of the traumatic event, and may be carried out in an explicit graduated manner or by discussing specific aspects of the trauma in various sessions [15].

Trauma-specific treatments for children and adolescents with comorbid aggressive or violent behavior

Any psychotherapeutic treatment delivered individually or in a group setting that predominantly used trauma-focused cognitive, behavioral or cognitive-behavioral techniques and could involve exposure to the traumatic event. In addition, these treatments focused on teaching positive alternatives to aggressive or violent based interpersonal behavior.

Other treatments

Because mental health problems; e.g., anxiety, suicidal ideation and sleep problems; are likely to co-occur in children reporting PTSD, and this co-occurrence of problems is likely to complicate treatment [75]. This category describes any psychotherapeutic treatment delivered individually or in a group setting that predominantly focused on other mental health problems than PTSD and used non-trauma focused cognitive, behavioral or cognitive-behavioral techniques.

Summaries of psychotherapeutic treatments

In this section, the trauma-specific treatments will be described first. The trauma-specific treatments for children and adolescents with comorbid aggressive or violent behavior and other treatments are then described sequentially.

Trauma-specific treatments

Eye movement desensitization and reprocessing (EMDR) was evaluated in three studies [2, 36, 66]. In addition to the provided bilateral stimuli, which were provided to restore distressing memories [63], several age-specific modifications were used in the three studies. For example, explicit attention was given to emotions and cognitions, and the final session was intended to instill motivation for behavioral change [3, 30]. Ahmad et al. [2] found a small between group effect size; however, post-treatment scores on PTSD-related symptoms of the EMDR group were significantly lower than the WLC group. In the Jabergha-deri et al. [36] study, the between group effect size can be considered medium. The between group effect size for the study of Soberman et al. [66] could not be calculated; however, the EMDR group showed significant reductions

Table 2 Methodological quality of included studies

Study	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other bias
Ahmad et al. [2]	?	?	−	+	+	−	?
Ahrens and Rexford [4]	?	?	−	?	?	+	?
Berkowitz et al. [2]	+	?	−	−	+	−	?
Cohen et al. [13]	?	?	−	+	+	+	?
Cohen et al. [16]	+	?	−	+	−	+	?
Cohen et al. [14]	+	?	−	+	−	+	?
Danielson et al. [20]	+	?	−	?	+	+	?
Deblinger et al. [24]	?	?	−	?	+	+	?
Deblinger et al. [22]	+	?	−	?	+	+	?
Ford et al. [28]	+	?	−	−	?	+	?
Gilboa-Schechtman et al. [29]	?	?	−	+	−	+	?
Haight et al. [32]	?	?	−	?	−	−	?
Jaberghhaderi et al. [36]	?	?	−	+	+	−	?
Kataoka et al. [38]	−	−	−	?	−	+	?
King et al. [41]	?	?	−	?	−	+	?
Krakow et al. [42]	−	−	−	?	−	−	?
Lange and Ruwaard [43]	−	−	−	?	+	+	?
Lyshak-Stelzer et al. [47]	?	?	−	+	?	+	?
Muris et al. [51]	?	?	−	?	?	+	?
Najavits et al. [52]	?	?	−	?	+	−	?
Pretorius and Pfeifer [53]	−	−	−	?	?	+	−
Raider et al. [55]	?	?	−	?	?	?	−
Rivard et al. [58]	−	−	−	?	−	−	?
Runyon et al. [60]	+	?	−	−	−	+	?
Smith et al. [65]	+	?	−	+	+	−	?
Soberman et al. [66]	?	?	−	−	+	+	?
Stein et al. [68]	+	?	−	−	?	+	?
Swenson et al. [69]	+	?	−	?	?	?	−
Taussig and Culhane [70]	?	?	−	?	−	+	?
Tourigny and Hébert [72]	−	−	−	?	+	+	?
Trowell et al. [73]	?	?	−	?	+	+	?
Weiner et al. [76]	−	−	−	?	?	+	?
Wolfe et al. [78]	?	?	−	?	−	−	?

+, low risk of bias; −, high risk of bias; ?, unclear risk of bias

of memory-related distress and problem behavior, and also a trend toward a decrease in post-traumatic stress symptoms. The conclusions of the studies are limited mainly due to methodological shortcomings (e.g., small sample sizes, no assessment of treatment fidelity), however, it must be noted that the results of the studies are promising and improvements can be achieved in a relatively small number of sessions.

TF-CBT was evaluated in five studies [13, 14, 16, 24, 76]. Deblinger et al. [23] published a parallel follow-up study (not included in systematic review). The TF-CBT conditions contained a child and a non-offending parent component. The between group effect sizes of the five TF-CBT studies range from 0.22 to 0.70. The discrepancy between the effect sizes may be due to differences between the studies (e.g., utilized questionnaires, comparison groups). In general, the five studies confirm the evidence supporting the efficacy of TF-CBT. Deblinger et al. [24] demonstrated that an eight session condition including a trauma-narrative component was the most effective and efficient condition to reduce children's abuse-related fear and general anxiety. Also, TF-CBT has proven its efficacy in minority youth [76].

Seven studies [22, 36, 38, 41, 60, 65, 68] evaluated the efficacy of diverse forms of cognitive-behavioral therapy (CBT). The overall aim of CBT was to help the child conquer his or her PTSD symptoms. Overall, the included CBT studies report adequate between group effect sizes, which are

in line with previous research providing support for the use of CBT in children with trauma-related symptoms [67]. Except for the study of Deblinger et al. [22], in which a small (0.07) between group effect size was found. However, the results of former study indicate that children in the CBT group showed significant improvement in body safety skills and also their non-offending mothers improved on several outcomes (e.g., intrusive thoughts, negative emotional reactions).

Two studies evaluated treatments in which the use of art activities (e.g., drawing, making collages) was an important component [47, 53]. The art therapies involved a holistic approach in which emotional and cognitive issues were actively addressed and social, physical and developmental growth were enhanced. Even though both studies faced a number of methodological limitations (e.g., small sample size, presence of confounding variables); the between group size found in the study by Lyshak-Stelzer et al. [47] provides support that art activities may be a useful tool for traumatized children to express their feelings/thoughts and release tension, as verbal communication alone could be too overwhelming.

Weiner et al. [76] studied the effects of child-parent psychotherapy (CPP). CPP was designed for children aged 0–6 years. The aim of the treatment was to decrease traumatic stress responses, learning difficulties, relationship problems, and improving parent–child attachment. Small between group effect sizes were found in the study; however, the results indicate that CPP is effective in improving functioning and reducing trauma-related symptoms in minority youth.

The following studies evaluated a number of less well-known and less well-investigated treatments: cognitive processing therapy (CPT) [4], child and family traumatic stress intervention (CFTSI) [7], child-centered therapy (CCT) [13, 16], non-directive supportive therapy (NST) [14], risk reduction through family therapy (RRFT) [20], trauma affect regulation: guide for education and therapy (TARGET), enhanced treatment as usual (ETAU) [28], prolonged exposure therapy for adolescents (PE-A), time limited dynamic psychotherapy for adolescents (TLDP-A) [29], life story intervention (LSI) [32], a new therapist-assisted web-based treatment for adolescent victims of sexual abuse [43], seeking safety (SS) [52], Trauma Intervention Program for Adjudicated and at-risk Youth (SITCAP-ART) [55], the Sanctuary model [58], an open and closed group therapy [72] (parallel study by Tourigny et al. [71]), and structured psychotherapy for adolescents responding to chronic stress (SPARCS) [76]. A number of the above mentioned approaches can be identified as meriting further research. For example, large between group effect sizes were found for CPT, a new therapist-assisted web-based treatment for adolescent victims of sexual abuse, SS, and the open and closed group therapy by Tourigny and Hébert [72].

Trauma-specific treatments for children with comorbid aggressive or violent behavior

Two studies evaluated treatments that focused on teaching positive alternatives to aggressive or violent-based interpersonal behavior: multisystemic therapy for child abuse and neglect (MST-CAN), enhanced outpatient treatment (EOT), systematic training for effective parenting of teens (STEP-TEEN) [69], and Youth Relationships Project (YRP) [78]. The between group effect sizes could not be calculated for both studies; however, the results showed that the MST-CAN condition was significantly more effective than the EOT condition in reducing a number of outcomes (e.g., mental health symptoms, out-of-home placements, parental psychiatric distress). Wolfe et al. [78] demonstrated that YRP was effective in reducing emotional distress and incidents of physical and emotional abuse. As chronic childhood maltreatment has been associated with aggressive and violent behavior [25, 54], the results of both studies provide a valuable opportunity to treat and reduce violence in youths.

Other treatments

Four studies evaluated treatments that predominantly focused on other mental health problems than PTSD: imagery rehearsal therapy [42], Individual Coping Koala CBT, Group Coping Koala CBT [51], Fostering Healthy Futures (FHF) [70], an individual psychotherapy and group psychotherapy [73]. The treatments focused on a variety of mental health problems (e.g., chronic nightmares, anxiety). The between effect sizes found in the studies can be considered small to medium. However, it is important to recognize that these studies are of great importance as childhood maltreatment may lead to broad range of psychopathological outcomes. For example, Krakow et al. [42] demonstrated that the number of nights in which the girls experienced nightmares, significantly decreased in the treatment group; while the control group showed no significant changes. Trowell et al. [73] demonstrated that both treatment groups showed a reduction on psychopathological symptoms and an improvement in functioning, with no significant difference between individual and group therapy. However, children receiving individual therapy experienced greater reductions on PTSD symptoms.

Conclusion and discussion

The objective of the present review was to systematically evaluate psychotherapeutic treatments for children exposed to childhood maltreatment. Because exposure to childhood maltreatment has been associated with a broad range of

trauma-related psychopathology (e.g., PTSD, anxiety, suicidal ideation, substance abuse) and with aggressive and violent behavior, this review also describes treatments which focus on former broad range of psychopathological outcomes. The results of this review show that there are 26 randomized controlled clinical trials and seven non-randomized controlled clinical trials of psychotherapeutic treatments for these children. A total of 27 studies evaluated psychotherapeutic treatments which used trauma-focused cognitive, behavioral or cognitive-behavioral techniques; only two studies evaluated trauma-specific treatments for children and adolescents with comorbid aggressive or violent behavior; and four studies evaluated psychotherapeutic treatments that predominantly focused on other mental health problems than PTSD and used non-trauma focused cognitive, behavioral or cognitive-behavioral techniques. These studies were published in the last 12 years, and are a heterogeneous collection of studies. The children who participated in the studies varied from sexually abused and maltreated children in child psychiatric outpatient clinics [e.g., 2, 14] or in foster care [32, 70, 76] to traumatized incarcerated boys [4]. In terms of gender, some studies included only girls [28, 36, 42, 52, 53, 72, 73], while other studies included only boys [4, 66] or combined both groups [e.g., 47, 55, 69]. Furthermore, the evaluated treatments vary as diverse forms of cognitive-behavioral therapy, EMDR, TF-CBT and other forms of psychotherapeutic treatments were evaluated. This finding demonstrates the heterogeneity of research in this area and the difficulty of drawing clear conclusions. However, as three relatively high-quality randomized controlled clinical trials [e.g., 13, 14, 16] provided support for TF-CBT, this method is, in line with findings of previous research [19], the best-supported treatment for such children. In addition, the results of one study [24] indicated that TF-CBT, regardless of the length of treatment and the inclusion of a TN component, is effective in improving children's symptomatology and safety skills, and parenting skills. Furthermore, CBITS—a cognitive-behavioral treatment for use in schools—has been thoroughly evaluated in a quasi-experimental study [38] and a randomized controlled clinical trial [68], the results of these studies providing support for CBITS as the best treatment option for children who can be treated in groups in their school setting. Nevertheless, in line with increased interest in the diagnosis of complex PTSD and given the likely relationship between childhood maltreatment and aggressive and violent behavior [75], the authors suggest that clinical practice should address a phase-oriented approach. There is growing consensus that the treatment process of these children should occur in three phases: (1) stabilization, (2) resolution of traumatic memory, (3) personality (re)integration and rehabilitation [17, 27, 33]. None of the evaluated treatments in this review explicitly incorporated a phase-oriented approach. Although several treatments (e.g., TF-CBT, SITCAP-ART) included psycho-education, emotion awareness or emotion modulation during the initial sessions, these elements were not provided, completely differentiated from the actual exposure part.

The results of this review indicate several points of inquiry, which also hold relevance for clinical practice. First, treatment non-completion and children lost at follow-up assessment were relatively high in the included studies [e.g., 24, 28, 29, 60]. It is unclear whether those who drop out of treatment or do not complete follow-up assessment respond in the same way as those who completed treatment and follow-up assessment. Consequently, factors related to treatment non-completion should be studied and methods should be explored in which children and families can be actively maintained in treatment [67]. Second, most of the evaluated treatments in this review involved parents or caregivers in some way. The elements of the parents' sessions varied from providing psychoeducation [e.g., 7, 36, 60] or learning behavior management skills [e.g., 13, 22, 41] to just attending a child's session [2, 52]. The method of the involvement varied as well, from including non-offending parents [13, 22, 24] versus at-risk or offending parents [60] or including parallel sessions versus joint sessions. This variety recommends a need to define more clearly the most advantageous role of parents' involvement. In addition, since research findings are contradictory about the potential gains of parental involvement and the limited evidence detailing the impact of their involvement on child outcomes [61, 67], further investigation is necessary. For example, only one study [41] included in this review compared child only CBT with family CBT. In family CBT, parents received 20 sessions of guidance in child behavior management skills and parent–child communication skills, and no significant differences were found between child only CBT and family CBT. Furthermore, it is remarkable that only one study [60] in this systematic review explicitly included at-risk or offending parents, whereas it is of great importance to address these at-risk or offending parents in clinical work and research as they are likely the most frequent perpetrators of childhood maltreatment. Third, despite the knowledge about gender differences in the development of PTSD and co-occurring symptoms, with higher rates among females versus their male counterparts [35, 39], further attention needs to be paid to possible gender differences in treatment responsiveness. Finally, only two of the studies included in this review evaluated trauma-specific PTSD treatments for children with comorbid aggressive or violent behavior. Although the effects of childhood maltreatment can manifest in many ways, childhood maltreatment has been found to be a risk factor for the

development of violent, antisocial and aggressive behavior. In addition, antisocial youth have been found to have high rates of PTSD [31]. These findings suggest the need for addressing childhood maltreatment and PTSD when treating this vulnerable group.

Limitations of the studies

A key limitation of all studies is their sample size. Moncrieff et al. [50] classify a sample size as adequate if the N per group is more than 100; or if an accurate power calculation is available which indicated that a smaller N was adequate. Only one [13] of the studies included can be considered large with a total of more than 100 per group. In studies with small sample sizes, the clinical significance of the results may be overestimated. Furthermore, several basic design flaws are evident in the included studies such as the failure to blind assessors, no accurate power calculation and no information about the extent to which the treatment was delivered as intended. In addition, none of the studies reported about possible side effects of the evaluated treatments. Despite the awareness that psychotherapy is an accepted and effective treatment option within the health care community, we can no longer claim that psychotherapy will never have negative side effects such as a possible increase in symptoms, development of new symptoms or dependency on the therapy relationship. For this reason, researchers need to describe and examine the possible negative side effects of psychotherapy [6]. Another point that can be made is, none of the included studies acknowledge the existence of, or made an attempt to address measures associated with complex PTSD. Whereas available evidence implies that symptoms related to exposure to chronic childhood maltreatment may form the basis for a distinct new psychiatric disorder or, a framework within which to research this topic. Consequently, further research is needed to systematically develop and investigate the clinical value and validity of a potential new diagnosis: complex PTSD [21, 45, 56], or as van der Kolk [74] refers to developmental trauma disorder. As a final point, in studies which included children in residential settings, it is difficult to disentangle the effect of specific PTSD treatment elements from effects of the treatment setting itself.

Methodological limitations of this review

This systematic review has a number of limitations. First, we only included randomized and non-randomized controlled clinical trials that evaluated psychotherapeutic treatments that described the use of cognitive-behavioral techniques; it is important to acknowledge that other types of interventions, e.g., pharmacological interventions, attachment-based interventions or play therapy [12], may

be effective in reducing trauma-related psychopathology in maltreated children. Second, our population selection criteria could be seen as arbitrary in that we excluded studies in which PTSD or PTSD symptoms were not measured, whereas childhood maltreatment may lead to diverse negative reactions other than PTSD or PTSD symptoms. We applied these selection criteria to keep the population examined in this review as homogeneous as possible. In addition, by excluding studies involving only children younger than the age of 6, we may have excluded some excellent work which focuses on maltreated preschoolers. However, as exposure to childhood maltreatment has been associated with aggressive and violent behavior, one aim of the current study was to provide a systematic review of evidence-based psychotherapeutic treatments which focuses on teaching positive alternatives to aggressive or violent-based interpersonal behavior. As most young children do not have the cognitive capacity to comprehend aggression fully [48], we excluded children younger than the age of 6. Third, we were not able to compare the effect sizes between adolescents and younger children, as many studies described in this review used a wide age-range and included adolescents as well as younger children. Although we are aware that treatment targeted at a range of anxiety disorders with adolescents show larger effect sizes than with younger children [57]. Fourth, although we did an extensive search and publication in a language other than English was not an exclusion criterion, we did not search non-English-language databases, which may have led us to overlook some relevant studies.

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