

CHILDREN'S MENTAL HEALTH RESEARCH

Quarterly

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Treating posttraumatic stress disorder in children

OVERVIEW

Refining diagnoses,
building strengths

REVIEW

Effective treatments
for childhood PTSD



About the Quarterly

We summarize the best available research evidence on a variety of children's mental health topics, using systematic review and synthesis methods adapted from the *Cochrane Collaboration* and *Evidence-Based Mental Health*. We aim to connect research and policy to improve children's mental health. The BC Ministry of Children and Family Development funds the *Quarterly*.

About the Children's Health Policy Centre

We are an interdisciplinary research group in the Faculty of Health Sciences at Simon Fraser University. We focus on improving social and emotional well-being for all children, and on the public policies needed to reach these goals.

To learn more about our work, please see childhealthpolicy.ca.

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Controversies persist with diagnostic standards for posttraumatic stress disorder. As well as exploring the validity of the complex PTSD diagnosis, we discuss strengths-based approaches to preventing PTSD.



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Fighting racism

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How to Cite the Quarterly

We encourage you to share the *Quarterly* with others and we welcome its use as a reference (for example, in preparing educational materials for parents or community groups). Please cite this issue as follows:

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Refining diagnoses, building strengths

At any given time, approximately one in a thousand children (or 0.1%) develop posttraumatic stress disorder (PTSD) after being exposed to serious adversities.¹ According to the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (*DSM-5*), to receive a PTSD diagnosis, children must meet the following criteria:

- Being exposed to actual or threatened death or serious injury or sexual violence — through directly experiencing or witnessing or learning of such events
- Experiencing clinically significant problems related to the trauma that continue for a month or more and that impair the child's functioning, including:
 - intrusive, recurrent and distressing memories or dreams or flashbacks, or intense psychological distress or physiological reactions
 - avoidance of associated situations such as specific places or people
 - negative thoughts and emotions such as fear, horror, anger, guilt or shame
 - hyper-reactivity, including anger outbursts and sleep difficulties.²

The *DSM-5* also provides separate PTSD diagnostic criteria for children aged six years and younger — recognizing that symptoms may differ when compared with those of older children (and adults). For example, for young children, intrusive symptoms may involve re-enacting trauma during play.²

When children are exposed to repeated traumas

Even though the *DSM-5* acknowledges different PTSD symptoms among younger children, it has been criticized by practitioners and researchers for omitting complex posttraumatic stress disorder (complex PTSD).³ This condition is included in the World Health Organization's *International Classification of Diseases*, 11th revision (*ICD-11*).⁴ Calls to recognize complex PTSD as a distinct disorder arose from concerns that the PTSD diagnosis may not adequately capture the experiences of those exposed to repeated traumas.⁵ Complex PTSD is recognized as typically developing after prolonged exposure to extremely threatening or horrific events such as repeated sexual or physical abuse that the child cannot escape from. Complex PTSD includes all the PTSD criteria — coupled with severe and persistent difficulties in regulating emotions, along with experiencing guilt or shame related to the trauma and challenges in sustaining relationships.⁴



Having a warm and accepting parent can buffer the effects of trauma.

Approximately 75–90% of children exposed to trauma do *not* develop PTSD.

Studies have found complex PTSD to be a valid diagnosis.⁵ Specifically, individuals with complex PTSD show distinct difficulties with self-organization that are typically not found with PTSD.⁶ Complex PTSD as a diagnosis may therefore be useful in not only characterizing the results of severe child maltreatment, but also encouraging research on prevention and treatment options.

Identifying risk to encourage resilience

The research evidence is also clear that many children show great resilience in the face of adversity. In particular, approximately 75–90% of children exposed to trauma do *not* develop PTSD.^{7–8} Factors that protect children from developing this disorder include strong family and peer supports.⁹ (Please see our [prior issue](#) for more information on protective factors.)

The foremost goal should be to prevent avoidable childhood adversities wherever possible.

Besides recognizing protective factors, it is also important to consider risk factors for developing PTSD after trauma. To determine risk factors, researchers systematically identified and analyzed 40 long-term studies on posttraumatic stress reactions in children.¹⁰ Predictors for developing posttraumatic stress reactions included injury severity and days in hospital, as well as the stress symptoms occurring soon after the trauma. Having a parent with posttraumatic stress symptoms also increased risk, as did the child having symptoms of depression or anxiety. In contrast, child age, ethnicity and socio-economic status were unrelated to risk.¹⁰

The research as to what increases risks for posttraumatic stress also suggests ways to help, for example, by strengthening family supports. But the foremost goal should be to prevent avoidable childhood adversities wherever possible. When trauma cannot be prevented, ensuring the child's basic safety is the first step. And if PTSD symptoms have developed, effective treatments are urgently required. In British Columbia, as many as 700 children may have PTSD at any given time.¹¹ To address the needs of these young people, the following [Review article](#) presents several treatment options. 🙌



PTSD rates may increase due to the pandemic as many children may experience the loss of a loved one or witness loved ones being seriously affected.

Effective treatments for childhood PTSD

Once a child has been diagnosed with PTSD, and their safety has been assured, they need immediate access to effective treatments. To inform practice and policy, we therefore conducted a systematic review on what such treatments entail.

We built quality assessment into our inclusion criteria, requiring studies that used randomized controlled trial (RCT) evaluation methods. We searched for RCTs published in the past 11 years, coinciding with when we last reviewed this topic. We also examined a previous Quarterly issue to identify studies that met our current inclusion criteria, including most child participants meeting criteria for PTSD and the reporting of PTSD-related outcomes. (The Methods section gives more details on our search strategy and inclusion criteria.)

We retrieved and evaluated 123 studies, first reviewing those where interventions were compared with a control group. For psychosocial treatments, this included no-treatment and active-control conditions, such as supportive counselling. For medications, we required placebo controls. We then reviewed studies that directly compared two treatments, provided there was evidence of effectiveness for one of the treatments being evaluated against a control group.

Five RCTs met our inclusion criteria. These included two psychosocial interventions — Prolonged Exposure for Adolescents¹²⁻¹⁴ and KIDNET¹⁵ — evaluated in three RCTs. Both Prolonged Exposure and KIDNET were based on cognitive-behavioural therapy (CBT). We also accepted one head-to-head trial comparing CBT to Eye Movement Desensitization and Reprocessing (EMDR).¹⁶ As well, one medication RCT met our inclusion criteria, evaluating D-cycloserine.¹⁷

Psychosocial studies

The CBT program Prolonged Exposure was tested in two RCTs. The first trial involved Israeli teens with PTSD caused by single traumatic events, such as motor vehicle accidents (42.1%), sexual assaults (21.1%) and terrorist attacks (13.2%).¹² Most participants (81.6%) also had concurrent mental health diagnoses. Prolonged Exposure was compared to non-trauma-focused psychodynamic therapy.¹²



Numerous children maintain a positive developmental trajectory following a trauma.

Practitioners encouraged children to describe their emotions, thoughts and sensory experiences during the traumas.

Prolonged Exposure was delivered individually in three stages for up to 15 weeks.¹² First, practitioners presented the treatment rationale and taught children a breathing exercise. Second, practitioners helped children construct an “exposure hierarchy,” organizing components of the traumatic event from least to most distressing. Children then practised being exposed to these experiences, either by memory or in-person, when it was safe to do so. For example, if a child developed PTSD after being in a motor vehicle accident, the child could practise being in the location where the accident occurred. During exposures that involved recalling the trauma from memory, young people were audiotaped recounting the event. They then listened to the recordings, which exposed them to their traumatic memories, so these memories would no longer evoke high levels of fear and avoidance. The third stage focused on relapse prevention, including identifying potential future challenges and ways of coping with them.

The second Prolonged Exposure trial, for up to 14 weeks, involved ethnically diverse American teen girls who had been sexually abused.¹³ All had PTSD — or nearly met PTSD diagnostic criteria. Most participants (57.4%) also had concurrent mental health diagnoses. In this RCT, Prolonged Exposure was compared to supportive counselling.

In contrast, the CBT-based KIDNET trial was designed to treat children with PTSD caused by repeated exposure to war and other forms of organized violence.¹⁵ This RCT, conducted in Germany over eight weeks, included children aged seven to 16 who were refugees from countries such as Syria. These children had faced severe traumas, such as violent attacks on family (73.1%) or community members (50.0%). All had PTSD. Many also had concurrent conditions such as separation anxiety disorder (38.5%), depression (26.9%) and specific phobias (11.5%). As well, half were experiencing thoughts of suicide and all faced the possibility of deportation. KIDNET was compared to a no-treatment control group.¹⁵

CBT was effective for children who had experienced a variety of traumas.

KIDNET practitioners supported children to tell their life stories, with a focus on traumatic experiences.¹⁵ Practitioners encouraged children to describe their emotions, thoughts and sensory experiences during the traumas, as well as associated physiological reactions. During such exposure exercises, children could also be asked to re-enact their physical positioning during the traumas, such as crouching during a bombing. Throughout, practitioners carefully recorded children’s descriptions and created a document of their experiences with links to specific places and times. They then created a written narrative, including positive and negative events, to continue to assist the child in healing from the trauma.¹⁸

A medication study

One RCT evaluated D-cycloserine, based on preliminary evidence of its efficacy for adults with PTSD.¹⁷ (This medication originally used to treat tuberculosis is thought to influence neurotransmitters involved in some mental health problems.)¹⁹ The RCT involved ethnically diverse American children who had experienced or witnessed at least one life-threatening event. Most had experienced two such events — with sexual (31.6%) and domestic violence (26.3%) being the most common. Although children with autism, bipolar disorder or schizophrenia were excluded from participating, children with other concurrent mental disorders were included (however, study authors did not report the concurrent disorders participating children experienced or the percentages of children affected by them).¹⁷ Control children received a placebo.

Children in both intervention and control groups also participated in CBT for PTSD over 12 weeks, including education, relaxation and exposure exercises. Exposures occurred in practitioners’ offices and in the community. Parents were involved in all sessions. Children took either 50 mg of D-cycloserine or

placebo before therapy sessions 5 through 11 — an hour prior to exposure exercises — to assess whether this medication enhanced CBT’s effects.¹⁷ Table 1 summarizes the four RCTs.

Table 1: Psychosocial and Medication Studies			
Intervention	Approach	Sample size	Ages (country)
Psychosocial			
Prolonged Exposure for Adolescents ¹²	Weekly individual CBT for up to 15 weeks, delivered to children exposed to a single trauma	38	12–18 yrs (Israel)
Prolonged Exposure for Adolescents ¹³	Weekly individual CBT for up to 14 weeks, delivered to teen girls who had been sexually abused	61	13–18 yrs (United States)
KIDNET ¹⁵	Weekly individual CBT for 8 weeks, delivered to refugee children exposed to multiple traumas	26	7–16 yrs (Germany)
Medication			
D-cycloserine ¹⁷	Weekly doses for 7 weeks, delivered to children exposed to at least one trauma	57	7–18 yrs (United States)

What did the studies show?

For all studies, we report on PTSD-specific outcomes and overall functioning where available. In the first Prolonged Exposure study, the intervention led to statistically significant improvements for all PTSD-related outcomes.¹² In particular, 63.2% of Prolonged Exposure youth were diagnosis free at six-month follow-up, compared to 26.3% of controls. Prolonged Exposure youth also reported significantly fewer PTSD symptoms, differences that were both statistically significant and clinically meaningful (Cohen’s $d = 0.51$). As well, Prolonged Exposure youth showed improved overall functioning, with a moderate effect size ($d = 0.55$). However, group differences were no longer significant for the one PTSD symptom measure used at 17-month follow-up.

In the second Prolonged Exposure study, the intervention led to significant improvements on most PTSD-related outcome measures.^{13–14} In particular, 89.0% of Prolonged Exposure youth were diagnosis free at one-year follow-up, compared to 54.7% of controls.¹³ Prolonged Exposure youth also had significantly milder PTSD symptoms than controls by both self-report and examiner ratings, with a large effect size ($d = 0.81$) for the latter.¹³ But there was no significant difference on a measure that combined the number and severity of self-reported PTSD symptoms.¹⁴ Finally, overall functioning improved significantly more for Prolonged Exposure youth.¹³

KIDNET also led to several benefits at four-month follow-up.¹⁵ Intervention children had significantly fewer intrusive thoughts and avoidance symptoms. KIDNET also significantly reduced the severity of PTSD symptoms — by 60%. As well, 84.6% of intervention children no longer met diagnostic criteria for PTSD, compared with 30.8% of controls. (The authors did not report statistical significance for this finding.) KIDNET also led to better overall functioning. Hyperarousal was the only PTSD symptom that this intervention did not significantly improve.¹⁵

The sole medication trial found no difference in posttraumatic stress symptoms for children on D-cycloserine compared with controls at three-month follow-up.¹⁷ Importantly, both intervention and control children received CBT — and all had significantly lower posttraumatic stress symptom scores at follow-up.

Children should be provided with effective treatments addressing *all* of their mental health concerns.

In fact, scores were reduced by approximately 50% between baseline and follow-up, suggesting benefits from CBT.¹⁷ Table 2 summarizes outcomes from the four trials.

Interventions	Follow-up	Outcomes*
Psychosocial		
Prolonged Exposure for Adolescents ¹²	6 months	↓ PTSD diagnoses ↓ PTSD symptoms ↑ Overall functioning
	17 months	№ PTSD symptoms
Prolonged Exposure for Adolescents ^{13–14}	12 months	↓ PTSD diagnoses № PTSD symptoms ↓ PTSD symptom severity (2 of 2 measures) ↑ Overall functioning
KIDNET ¹⁵	4 months	↓ PTSD symptoms (2 of 3 measures) ↓ PTSD symptom severity ↑ Overall functioning
Medication		
D-cycloserine ¹⁷	3 months	№ PTSD symptoms
<p>* Unless otherwise specified, there was a single measure for each outcome. ↓ or ↑ Statistically significant improvements for intervention compared with control/comparison group. № No significant difference between intervention and control/comparison group.</p>		

A tale of two treatments

We accepted one trial directly comparing Eye Movement Desensitization and Reprocessing (EMDR) with CBT.¹⁶ (This trial also included a waitlist control group for part of the study.) Both treatments were tested with Dutch children whose PTSD was caused by a single traumatic event, such as sexual abuse (26.2%), physical abuse or assaults (23.3%), and accidents or injuries to loved ones (19.4%).¹⁶ About half of the children met criteria for at least one concurrent mental disorder.¹⁶

EMDR involved asking children to focus on memories of the traumatic event, including recalling images, thoughts, emotions and physical sensations.¹⁶ Children were then asked to concentrate on emotionally disturbing sensations triggered by the memory while moving their eyes to follow the practitioner's hand from side to side. Throughout, practitioners regularly stopped the movements and asked children to recall the original memory — repeating this approach until distress no longer occurred.¹⁶ The CBT included education, exposure to memories of the trauma, and cognitive restructuring. Children also produced written narratives summarizing their thoughts, feelings and behaviours during and after the trauma, as well as more adaptive ways of thinking about the experience and coping with it.²⁰ Table 3 summarizes this trial.

Intervention	Approach	Sample size	Ages (country)
Eye Movement Desensitization + Reprocessing (EMDR) vs.	Weekly individual EMDR for up to 6 weeks, delivered to children exposed to a single trauma	103	8–18 yrs (Netherlands)
Cognitive-Behavioural Therapy (CBT) ¹⁶	Weekly individual CBT for up to 6 weeks, delivered to children exposed to a single trauma		

Moving eyes and thoughts to move on from trauma

In the head-to-head trial, both EMDR and CBT led to improvements on PTSD diagnostic measures by three-month follow-up; however, authors did not report whether these reductions over time were statistically significant.¹⁶ Specifically, 86.8–95.0% of children who had been treated with EMDR were diagnosis free after three months, compared with 87.2–89.7% of children who had been treated with CBT (figures varied by informant, whether self- or parent-report), with no significant differences between the two treatments.¹⁶

At one-year follow-up, even more children were diagnosis free; however, once again authors did not report whether these further reductions over time were statistically significant. By self-report, 100% of EMDR children and 92.1% of CBT children were diagnosis free after one year, with no significant difference between the two groups. But by parent report, there was a statistically significant difference favouring EMDR, with 100% of children who received this treatment being diagnosis free, compared to 88.6% of those who received CBT.¹⁶

Beyond diagnoses, both EMDR and CBT also reduced PTSD symptoms at three-month and one-year follow-ups, with no significant difference between the two treatments. (Authors again did not report whether these reductions over time were statistically significant.) In sum, both treatments were effective, with EMDR showing only one statistically significant benefit over CBT — greater reductions in PTSD diagnostic rates by parent report at one-year follow-up. Table 4 summarizes these outcomes.

No child should be exposed to the kinds of serious adverse experiences that can give rise to PTSD.

Interventions	Follow-up	Outcomes
Eye Movement Desensitization + Reprocessing (EMDR) vs. Cognitive-Behavioural Therapy (CBT) ¹⁶	3 months	Both treatments resulted in ↓ PTSD diagnoses (child + parent report) ↓ PTSD symptoms (3 of 3 measures)
	1 year	Both treatments resulted in ↓ PTSD diagnoses (child + parent report) ↓ PTSD symptoms (3 of 3 measures) EMDR outperformed CBT in ↓ PTSD diagnoses (parent report)
↓ Improvements for given treatment from prior to treatment to specific follow-up. EMDR's benefits over CBT were statistically significant; however, benefits for each treatment over time were not tested for statistical significance.		

Implications for practice and policy

The results of this systematic review show that childhood PTSD can be effectively treated with CBT. In fact, three different CBT programs reduced diagnoses and/or symptoms across four different trials. All forms of CBT included a core component — namely, safely exposing children to traumatic memories so they no longer evoked high levels of fear and avoidance. EMDR, which also had children focus on traumatic memories until they no longer experienced distress, showed evidence of effectiveness in a single trial. In contrast, D-cycloserine did not show benefits. Five recommendations follow from these findings.

- **Use CBT when treating childhood PTSD.** Our review showed that CBT was effective for children who had experienced a variety of traumas, including multiple and complex traumas. As well, many children in these studies were experiencing concurrent mental health concerns, and CBT was still effective for their PTSD. This suggests that the findings have “real world” utility. CBT was also effective with ethnically diverse children, across ages ranging from seven to 18 years. So this form of treatment has wide applicability for PTSD in young people.

- **Consider EMDR if CBT does not fully resolve a child's PTSD.** Although there is more evidence supporting CBT to treat childhood PTSD, Eye Movement Desensitization and Reprocessing showed promise for children exposed to a single trauma, based on one trial. So this treatment could be considered if a child is continuing to experience symptoms after an adequate course of CBT. That said, EMDR needs further rigorous evaluation.
- **Do not rely on medications to treat childhood PTSD.** Based on this review, there are no medications that are effective in treating childhood PTSD. Instead, effective psychosocial treatments should be the mainstay.
- **Treat concurrent conditions using effective interventions.** Some children with PTSD will have concurrent mental disorders. These children should be provided with effective treatments addressing *all* of their mental health concerns. (Information about effective treatments for 12 of the most common disorders is available from our [recently released report](#).)
- **Be prepared for more children to present with PTSD during COVID-19.** Recent estimates suggest that PTSD may greatly increase due to the pandemic as many children may experience the trauma of losing loved ones or witnessing loved ones being seriously affected.²¹ CBT should still be used when trauma stems from COVID-19. (For more information on helping children during the pandemic, please see two recent reports on this topic, *COVID-19 and the Impact on Children's Mental Health* and *Supporting Children — By Supporting Practitioners and Families During COVID-19 and Beyond*.)

No child should be exposed to the kinds of serious adverse experiences that can give rise to PTSD.

Prevention of such experiences therefore remains the top priority. But when prevention has not been possible and a child develops PTSD, CBT can help. Children diagnosed with PTSD need rapid access to this effective treatment — to ensure that negative repercussions of any trauma are short-lived and that children can go on to thrive. 🙌



Many young people show great resilience in the face of adversity.

METHODS

We use systematic review methods adapted from the *Cochrane Collaboration* and *Evidence-Based Mental Health*. We build quality assessment into our inclusion criteria to ensure that we report on the best available research evidence, requiring that intervention studies use randomized controlled trial (RCT) evaluation methods and meet additional quality indicators. For this review, we searched for RCTs on interventions for treating posttraumatic stress disorder. Table 5 outlines our database search strategy.

Table 5: Search Strategy	
Sources	<ul style="list-style-type: none">• CINAHL, ERIC, Medline and PsycINFO
Search Terms	<ul style="list-style-type: none">• Post-traumatic stress disorders, post-traumatic stress, trauma <i>and</i> intervention or treatment
Limits	<ul style="list-style-type: none">• Peer-reviewed articles published in English between 2009 and 2020• Pertaining to children aged 18 years or younger• RCT methods used

To identify additional RCTs, we also hand-searched the Web of Science database, reference lists from relevant published systematic reviews and previous issues of the *Quarterly*. Using this approach, we identified 123 studies. Two team members then independently assessed each study, applying the inclusion criteria outlined in Table 6.

Table 6: Inclusion Criteria for RCTs
<ul style="list-style-type: none">• Studies provided clear descriptions of participant characteristics, settings and interventions• Interventions were evaluated in settings comparable to Canada• Most participants met diagnostic criteria for posttraumatic stress disorder at study outset• Attrition rates were 20% or less at final assessment and/or intention-to-treat analysis was used• Child outcome indicators included posttraumatic stress symptom and/or diagnostic outcomes, assessed using two or more informant sources• Reliability and validity were documented for primary outcome measures• Statistical significance was reported for primary outcome measures• Studies were excluded when authors stated there was insufficient statistical power
Psychosocial Treatment Studies <ul style="list-style-type: none">• Participants were randomly assigned to intervention and comparison groups (i.e., no-treatment or active control) at study outset. Head-to-head comparison trials were only accepted if at least one intervention was already established as being effective in an RCT• At least one outcome rater was blinded to participants' group assignment• Follow-up was three months or more (from the end of the intervention)
Medication Studies <ul style="list-style-type: none">• Participants were randomly assigned to intervention and placebo control groups at study outset• Double-blinding procedures were used

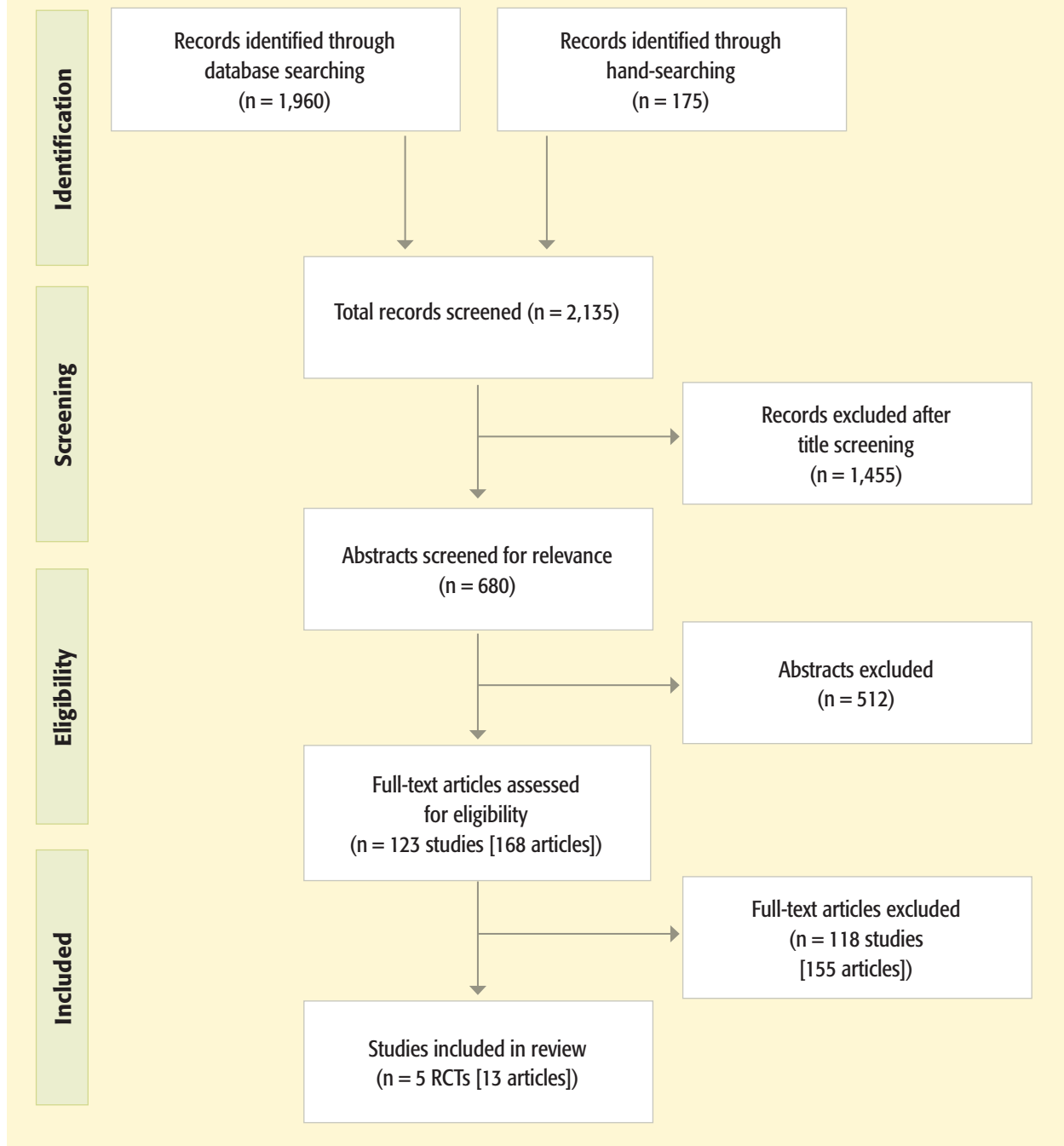
Five RCTs met all the inclusion criteria. Figure 1 depicts our search process, adapted from Preferred Reporting Items for Systematic Reviews and Meta-Analyses. Data from these studies were then extracted, summarized and verified by two or more team members. Throughout our process, any differences between team members were resolved by consensus. 🙌

For more information on our research methods, please contact

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Figure 1: Search Process for RCTs

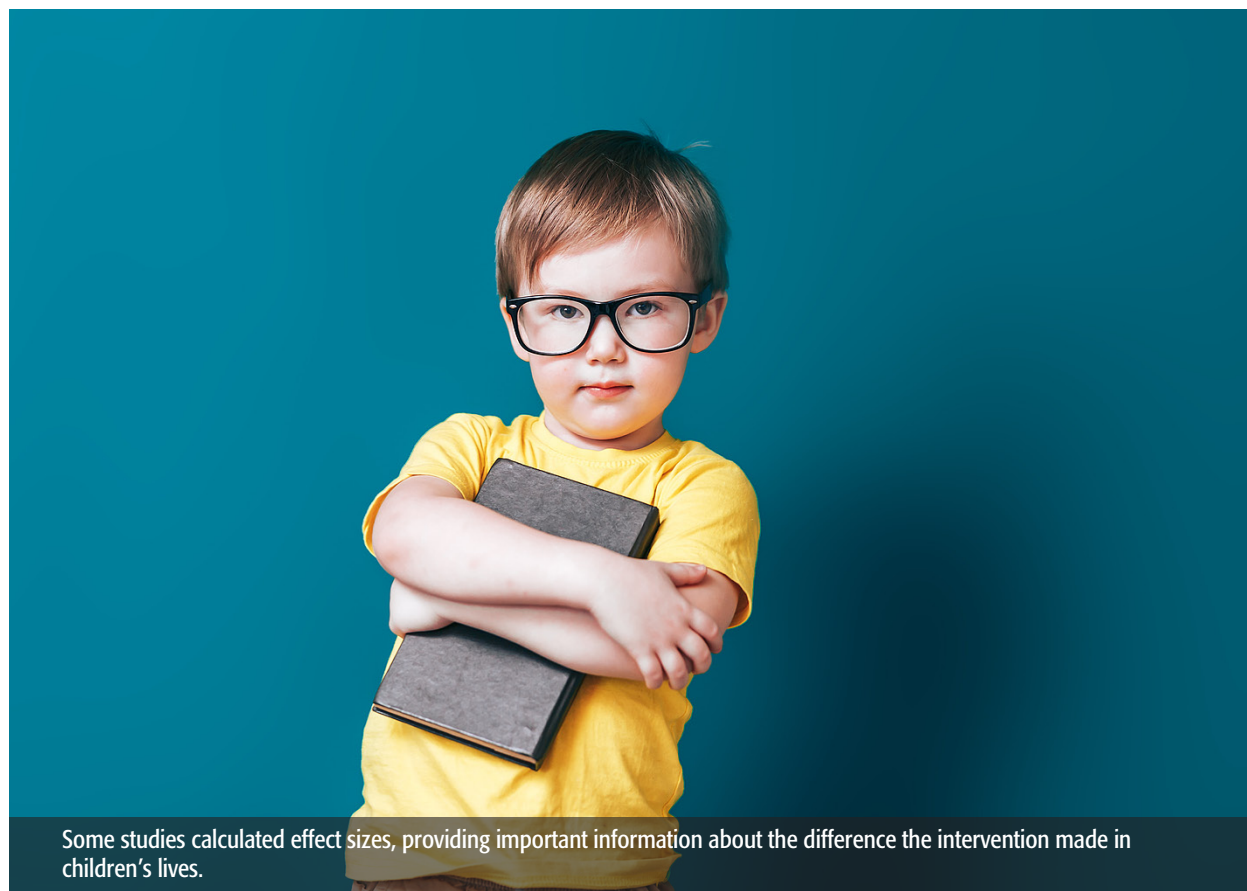
RESEARCH TERMS EXPLAINED

Practitioners and policy-makers need good evidence about whether a given intervention works to help children. **Randomized controlled trials** (RCTs) are the gold standard for assessing whether an intervention is effective. In RCTs, children, youth or families are randomly assigned to the intervention group or to a comparison or control group. In this issue of the *Quarterly*, some RCTs used a type of comparison group described as **active-control conditions**. These conditions involved providing other interventions, including supportive counselling and psychodynamic psychotherapy.^{12–13} These two comparison conditions were chosen because they were expected to be less effective than the intervention being evaluated, namely Prolonged Exposure for Adolescents, while still providing children with some support.

By randomizing participants — that is, by giving every young person an equal likelihood of being assigned to a given group — researchers can help ensure the only difference between the groups is the intervention. This process provides confidence that benefits are due to the intervention rather than to chance or other factors.

To determine whether the intervention provides benefits, researchers analyze relevant outcomes. If an outcome is found to be **statistically significant**, it helps provide certainty the intervention was effective rather than results appearing that way due to chance. In the studies we reviewed, researchers used the typical convention of having at least 95% confidence that the observed results reflected the program's real impact.

As well, some studies included in this issue determined whether the intervention was **clinically meaningful** by assessing the degree of difference the intervention made in the young person's life. This was achieved by calculating the **effect sizes** of outcomes, which provide a quantitative measure of the strength of the relationship between the intervention and the outcome. The studies reported on **Cohen's *d***, which can range from 0 to 2. Standard interpretations are 0.2 = small effect; 0.5 = medium effect; and 0.8 = large effect. 🙌



Some studies calculated effect sizes, providing important information about the difference the intervention made in children's lives.

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BC government staff can access original articles from [BC's Health and Human Services Library](#). Articles marked with an asterisk (*) include randomized controlled trial data that was featured in our Review article.

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LINKS TO PAST ISSUES

The *Children's Mental Health Research Quarterly Subject Index* provides a detailed listing of topics covered in past issues, including links to information on specific programs.

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