




## REVIEW ARTICLE

# Relative efficacy of psychological interventions following interpersonal trauma on anxiety, depression, substance use, and PTSD symptoms in young people: A meta-analysis

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## Abstract

**Aim:** Interpersonal trauma exposures are associated with anxiety, depression, and substance use in youth populations (aged 12–25 years). This meta-analysis reports on the efficacy of psychological interventions on these symptom domains in addition to post-traumatic stress.

**Methods:** Following PRISMA guidelines, a search of electronic databases was performed for randomized controlled trials (RCTs) assessing interventions for young people following interpersonal trauma exposure. Risk of bias was assessed using the Cochrane Risk of Bias tool. Data were analysed using random-effects meta-analyses.

**Results:** Of the 4832 records screened, 78 studies were reviewed, and 10 RCTs, involving 679 participants (mean age 15.6 years), were analysed. There was a large pooled effect size for post-traumatic stress (7 studies,  $g = 1.43$ , 95% CI [0.37, 2.15],  $p = .002$ ) and substance use (2 studies,  $g = 0.70$ , 95% CI [−0.11, 1.22],  $p < .001$ ) and small effect sizes for anxiety (4 studies,  $g = 0.30$ , 95% CI [0.10, 0.49],  $p = .003$ ), and trend-level effect for depression (10 studies,  $g = 0.27$ , 95% CI [0.00, 0.54],  $p = .052$ ). Heterogeneity was significant for post-traumatic stress and moderate for depression.

**Conclusions:** High-quality RCTs of psychological interventions for anxiety, depression, substance use, and post-traumatic stress symptoms in young people exposed to interpersonal trauma are scarce. While available studies show either statistically significant or trend-level efficacy for psychological interventions in reducing these symptoms, wide confidence intervals, heterogeneity and small sample size mean that results need to be interpreted with caution.

## KEYWORDS

adolescent, depression, post-traumatic, psychological intervention, young adult

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## 1 | INTRODUCTION

Exposure to interpersonal trauma (i.e., sexual, physical, and emotional abuse, neglect, maltreatment, and violence) is alarmingly common (Bradshaw et al., 2017; Copeland et al., 2007; Finkelhor et al., 2007). Epidemiological data show that young people are at highest risk of exposure to interpersonal trauma, with lifetime exposure estimated to reach 82% by the age of 22–23 years (Breslau et al., 2004). Although males are more likely than females to experience trauma, across epidemiological studies, post-traumatic stress symptoms are more prevalent among females than males (Alisic et al., 2014; Breslau et al., 2004). Exposure to interpersonal trauma can disrupt primary attachments and has been shown to increase the risk for altered social, psychological, and cognitive development in children, adolescents, and young adults. Interpersonal trauma can have negative consequences for affect regulation, attention and consciousness, self-identity, and interpersonal relationships (Cook et al., 2005; Courtois & Ford, 2009). Compared to children and adolescents who have experienced non-interpersonal trauma, those with experience of interpersonal trauma are more likely to develop a range of psychological disorders (Jaffee, 2017), including anxiety, depression (Nanni et al., 2012), and problematic substance use (Cisler et al., 2012), in addition to post-traumatic stress disorder (PTSD; Alisic et al., 2014; Gardner et al., 2019). Comorbidity of disorders is common, and when this occurs, young people are also more likely to experience lower self-efficacy (Adams et al., 2019), more significant psychosocial impairment (Dvir et al., 2014), and increased suicidality (Kahn et al., 2015).

Psychotherapy is considered the first-line treatment for young people following interpersonal trauma (Hetrick et al., 2010). Increasingly, community-based mental health services for young people are developing psychotherapy and other services to respond to this group's unique developmental needs (McGorry et al., 2013).

Previously, six meta-analyses have examined outcomes following psychotherapy for interpersonal trauma in children, adolescents, and young people of various ages. Four focused on outcomes for those aged up to 18 years following child sexual abuse (Harvey & Taylor, 2010; Macdonald et al., 2012; Sanchez-Meca et al., 2011; Trask et al., 2011); one focused on those aged up to 21 years following sexual abuse (Wethington et al., 2008); and the sixth focused on those up to 25 years following child sexual and physical abuse (Gutermann et al., 2016).

The review by Gutermann et al. (2016) included participants aged 3 to 25 years and found large significant effect sizes for outcomes of post-traumatic stress across child sexual and physical abuse. These results are in line with the medium-to-large effect sizes reported in reviews with younger populations (i.e., up to 18 years; Harvey & Taylor, 2010; Trask et al., 2011; Macdonald et al., 2012).

For children, adolescents, and young people (i.e., up to 21 years), effect sizes for anxiety were small and significant across all trauma types (Wethington et al., 2008). Results for child and adolescent populations (i.e., up to 18 years) were slightly more variable with small (Macdonald et al., 2012) and medium (Sanchez-Meca et al., 2011) effect sizes reported. Outcomes for depression were more inconsistent across all populations. Non-significant effect sizes were reported

by Wethington et al. (2008) and Macdonald et al. (2012), whereas Sanchez-Meca et al. (2011) reported small significant effect sizes for outcomes of depression. For substance use, adult studies indicate that trauma-focused cognitive-behavioural interventions, delivered alongside substance-use interventions, could be effective, with a small but significant effect size reported (Roberts et al., 2015).

Across these reviews, there was an over-representation of females (i.e., 75.45%, Gutermann et al., 2016; 66%, Sanchez-Meca et al., 2011). This is important to note as studies with a larger percentage of female participants reported greater effect sizes. None of the meta-analyses described above are focused exclusively on outcomes for young people (i.e., adolescents and young adults) – all of them included child participants. Furthermore, most studies focused on child sexual and physical abuse, but there has been less attention on the psychotherapy outcomes following exposure to a broader range of interpersonal trauma types such as neglect, maltreatment, and violence.

As adolescents age, therapeutic strategies are substantially altered to align with their verbal capacity and the developmental tasks facing them (Barry et al., 2018). Therefore, it is important that studies assessing the treatment of young people exposed to interpersonal trauma exclude data on children aged under 12 years as this group may have different treatment outcomes. Furthermore, even though anxiety, depression, and substance use following interpersonal trauma share core underlying vulnerabilities with post-traumatic stress, no meta-analysis has been undertaken on psychotherapy outcomes for these co-occurring problems in youth populations. An important gap also exists in differentiating between trauma types. As the efficacy of interventions is not convincingly demonstrated in current clinical trials (Russo, 2007), the goal of our meta-analysis was to review the empirical evidence and compare the differential efficacy of psychological interventions on outcomes for a) anxiety, b) depression, and c) substance use, in addition to d) post-traumatic stress, for adolescents and young adults (aged 12–25 years) who have experienced interpersonal trauma.

## 2 | METHODS

The meta-analysis was performed according to the PRISMA guidelines (Page et al., 2021). Studies were identified by searching CINAHL (via EBSCO), Cochrane Central Register of Controlled Trials (CENTRAL; via [cochranelibrary.com](http://cochranelibrary.com)), Embase (via EBSCO), MEDLINE Complete (via EBSCO), PsycINFO (via EBSCO) and PILOTS (via PROQUEST). Searches were conducted for studies published up to February 2019. Search terms were drawn from the Medical Subject Headings (MeSH) list with adaptations as appropriate for each database (see Table S3).

### 2.1 | Study selection and inclusion criteria

The literature search resulted in a total of 8405 references. The reference lists of earlier meta-analyses and systematic reviews (Gutermann

et al., 2016; Harvey & Taylor, 2010; Macdonald et al., 2012; Sanchez-Meca et al., 2011; Trask et al., 2011; Wethington et al., 2008) were screened for additional studies. Results were merged, and duplicates removed following the method outlined by Higgins and others (2019), resulting in a total of 4832 references (see Figure 1).

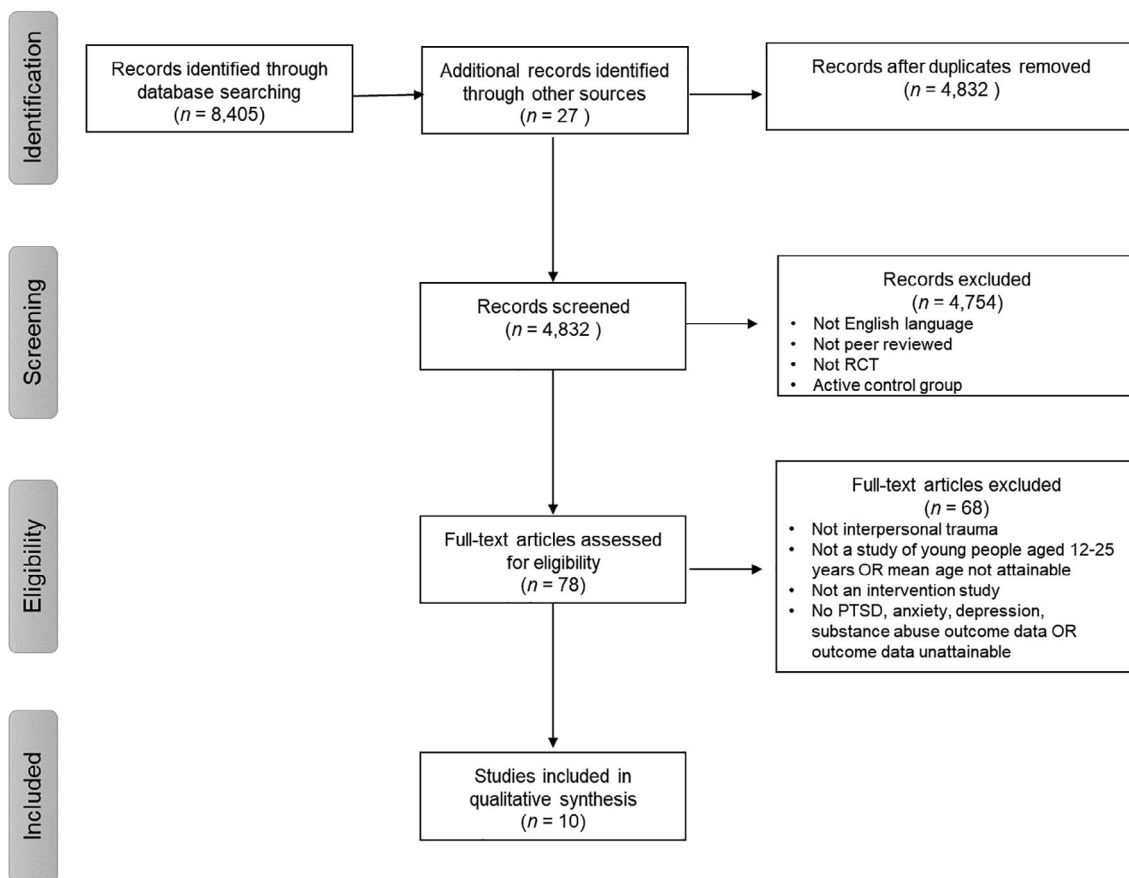
An a priori decision was made to search only for studies published in English. Criteria for including studies were: (a) peer-reviewed randomized controlled trials (RCTs) comparing at least one active psychological treatment to a control (i.e., waitlist, treatment as usual, or standard care); (b) mean age of participants between 12 and 25 years; (c) at least 80% of the study sample experienced one or more episodes of interpersonal trauma; and (d) outcome measures for anxiety, depression, or substance use completed with a validated instrument (self-report or clinical interview) at pre- and post-treatment. Although young people often do not meet the full diagnostic criteria for PTSD, these experiences can generate distressing (but subthreshold) symptoms requiring similar levels of treatment (McGorry & Mei, 2018). Therefore, we included studies that reported on both threshold and subthreshold symptoms.

Full-text articles of studies with PTSD as the primary outcome measure were reviewed if it was unclear from the abstract whether outcome data relating to anxiety, depression, or substance use were included, full articles were reviewed. Studies that reported on both interpersonal and non-interpersonal traumas were included only if

most participants (i.e., at least 80%) reported exposure to interpersonal trauma. Interpersonal trauma was defined as exposure to traumas that occur both within families or within inter-partner relationships or between individuals, including physical and emotional ill-treatment, sexual abuse (including rape), neglect, or other exploitation (WHO, 2006). Other types of interpersonal trauma, such as community and collective trauma (e.g., property damage, theft, mass shootings, terrorism, war, and natural disasters) were excluded (see Brown et al., 2017; Pfefferbaum et al., 2019). Reasons for exclusion are shown in Figure 1.

## 2.2 | Screening of articles

Studies to be included in the meta-analysis were screened following several steps (see Figure 1). First, WP screened the titles and abstracts of all references ( $n = 4832$ ) identifying only peer-reviewed RCTs published in English. This resulted in the exclusion of 4754 articles. In the second step, two reviewers (WP and EK) independently screened the remaining 78 full-text articles to determine if they met the inclusion criteria. This resulted in the exclusion of a further 68 studies, leaving 10 studies that met the inclusion criteria. Inconsistencies were discussed and resolved by consensus between the two reviewers. During this step it was decided to exclude three studies that compared two



**FIGURE 1** PRISMA flowchart. The data that support each step of the PRISMA flowchart is available from WP upon request

active treatments. These were Ford et al. (2018): Cognitive Behavioural Therapy (CBT) versus CBT plus Trauma Affect Regulation: Guide for Education and Therapy (TARGET); Diehle et al. (2015): EMDR versus Trauma-Focused Cognitive Behavioural Therapy (TF-CBT); and Jaberghaderi et al. (2004): CBT versus *Eye Movement Desensitization and Reprocessing* (EMDR). As both treatment conditions in these trials were expected to reduce PTSD, it was anticipated that their inclusion would confound the results of this meta-analysis which aimed to determine if active treatment for PTSD also helped depression, anxiety and substance-use symptoms.

### 2.3 | Data extraction and risk of bias assessment

Data extraction and quality assessment were completed independently by WP and EK for each study. The characteristics of each study were compiled: first author; year of publication; country; study design; sample size; participant characteristics; trauma type; assessment measurements for PTSD, anxiety, depression, and substance use; types of intervention and control conditions; and treatment duration (see Table S1). If any outcome was measured using more than one method, clinical interview measures were preferentially used if available; otherwise, self-report measures were utilized. If no well-known measure was, the outcome was only included if adequate psychometric data for the instrument was available. If more than one self-report measure was available, an a priori decision was made that results would be combined to obtain an overall outcome for the variable being measured. Where necessary, WP attempted to contact study authors to request additional or missing data, but in each case, the data were either unavailable or no response was received. As a result, four studies were excluded following correspondence from authors. Any inconsistencies in data extraction were discussed and resolved by consensus between WP, EK, and SB.

Risk of bias assessment was evaluated using the Cochrane Risk of Bias tool (Higgins et al., 2019). Overall methodological quality varied across studies. Of the 10 studies, four were assessed as having a low risk of bias, five had an unclear risk of bias, and one study had a high risk of bias (see Table S2). Selection bias (i.e., sequence generation and allocation concealment) was the area of greatest concern.

### 2.4 | Statistical methods

All analyses were conducted using the Comprehensive Meta-Analysis software (Borenstein et al., 2014). Intention-to-treat data were analysed if available. We calculated the effect size for each comparison between the intervention and control group for PTSD, anxiety, depression, and substance-use outcomes reported at the end of treatment. We reported Hedge's  $g$  and the associated 95% confidence intervals (CI) for each comparison. Hedge's  $g$  can be interpreted in the same way as Cohen's  $d$  values, that is, small: 0.2; medium: 0.5; and large: 0.8 (Cohen, 1988).

In order to assess heterogeneity among studies, the  $Q$  statistic was computed and tested for significance (Lipsey & Wilson, 2001). Higgins's  $I^2$  was used to quantify heterogeneity with  $I^2$  values of 0%–40%, 30%–60%, 30%–90%, and 75%–100% being considered low, moderate, substantial, or considerable, respectively (Higgins et al., 2019).

Mean effect sizes were estimated using random-effects meta-analysis as substantial heterogeneity was expected among the studies (Borenstein et al., 2009). To better understand the variance observed across outcomes, exploratory subgroup analyses were performed to examine differences in effect sizes based on intervention type (TF-CBT versus other treatments; Borenstein et al., 2009). Subgroup analyses were only completed when at least two studies were available per subgroup (Yap et al., 2016). As a result, no subgroup analysis was completed for anxiety and substance use. Subsequently, the remaining two subgroup analyses (PTSD and depression) were conducted using mixed-effects analyses that pooled studies within subgroups with the random-effects model, but tested for significant differences between subgroups with the fixed-effects model (Borenstein et al., 2009). To quantify the magnitude of the difference within and between subgroups, the  $Z$  test ( $Z_{diff}$ ; Borenstein et al., 2009) was calculated to interpret the between-group differences.

Initially, we planned to assess publication bias using the 'trim and fill' procedure (Duval & Tweedie, 2000). However, because the number of studies was fewer than recommended ( $n = 10$ ), the power of the tests was too low to distinguish chance from real asymmetry, and the procedure was therefore not carried out (Higgins et al., 2019).

## 3 | RESULTS

### 3.1 | Study characteristics

Table S1 lists the descriptive characteristics of the 10 studies. Sample size ranged from 20 to 159, and the age of participants ranged from 7 to 18 years. The grand mean age of participants was 15.6 years. Ninety-three percent of participants were female. Six studies were conducted in the United States (Auslander et al., 2017; Danielson et al., 2012; Foa et al., 2013; Ford et al., 2012; Najavits et al., 2006), three in Europe and the United Kingdom (Goldbeck et al., 2016; Jensen et al., 2014; Madigan et al., 2015) and one in Africa (O'Callaghan et al., 2013). Two studies (Danielson et al., 2012; Foa et al., 2013) examined the efficacy of treatment following child sexual abuse, whereas all the other studies included multiple types of interpersonal trauma (e.g., sexual abuse, physical abuse, emotional abuse, neglect, separation, loss, and exposure to domestic violence). For the outcome data, clinician-administered assessments were used where available. Otherwise, young people's self-report measures were considered. Outcome measures for PTSD treatment were included in all studies, but reported in only seven. Outcomes for anxiety were published in four studies, depression in 10 studies, and substance use in two studies (see Table S1).

Seven psychological interventions were identified: Cognitive Behavioural Intervention for Trauma in Schools (CBITS; Auslander et al., 2017); modified-Cognitive Behavioural Therapy (m-CBT; Shirk et al., 2014); Prolonged Exposure (PE; Foa et al., 2013); Risk Reduction Family Therapy (RRFT; Danielson et al., 2012); Seeking Safety (SS; Najavits et al., 2006); TARGET (Ford et al., 2012) and TF-CBT (Cohen et al., 2017). TF-CBT was the most commonly studied intervention. It was included in five of the 10 studies (Danielson et al., 2012; Goldbeck et al., 2016; Jensen et al., 2014; Madigan et al., 2015; O'Callaghan et al., 2013). All other treatments were assessed in only one study. Three control conditions were employed across the 10 studies: six used treatment as usual (Danielson et al., 2012; Ford et al., 2012; Goldbeck et al., 2016; Jensen et al., 2014; Madigan et al., 2015; Najavits et al., 2006), two used usual care (Auslander et al., 2017; Shirk et al., 2014), another used standard care (Foa et al., 2013), and the 10th study used a waitlist control (O'Callaghan et al., 2013).

One study delivered group and individual therapy (Auslander et al., 2017), and another offered only group therapy (O'Callaghan et al., 2013). All other studies provided individual treatment. Parents or caregivers were included in four of the studies (Auslander et al., 2017; Goldbeck et al., 2016; Jensen et al., 2014; Madigan et al., 2015) and were an optional component in another two (Najavits et al., 2006; Shirk et al., 2014; see Table S1).

The duration of planned treatment sessions varied widely across studies. The minimum was 50 min (Ford et al., 2012) and the maximum was 120 min (O'Callaghan et al., 2013). Number of treatment sessions also varied. The shortest sequence was eight sessions (Foa et al., 2013) and the longest was 25 sessions (Najavits et al., 2006). Total duration varied from 12 weeks (Madigan et al., 2015; Najavits et al., 2006; O'Callaghan et al., 2013) to 51 weeks (Danielson et al., 2012). The actual dose (in min × weeks) could not be determined. However, results indicated that actual treatment (measured in number of sessions attended) ranged from five (Madigan et al., 2015) to 13 (O'Callaghan et al., 2013), with a mean of 10 sessions across all studies. Across studies, the actual number of sessions attended was much lower than the planned number of sessions.

### 3.2 | Results from meta-analysis

#### 3.2.1 | Post-traumatic stress disorder

Seven studies examined the pre- versus post-efficacy of psychological interventions compared to controls in reducing symptoms of post-traumatic stress (Auslander et al., 2017; Danielson et al., 2012; Foa et al., 2013; Ford et al., 2012; Goldbeck et al., 2016; Jensen et al., 2014; O'Callaghan et al., 2013). Effect sizes are displayed in Figure 2. Pooled effect size for PTSD was large and statistically significant ( $g = 1.43$ , 95% CI [0.37, 2.15],  $p = .002$ ). Heterogeneity was also substantial ( $Q = 73.68$ ,  $df = 6$ ,  $p = .00$ ,  $I^2 = 91.8%$ ).

#### 3.2.2 | Anxiety

A total of four studies examined the pre- versus post-efficacy of psychological interventions compared to controls in reducing symptoms of anxiety (Ford et al., 2012; Goldbeck et al., 2016; Jensen et al., 2014; Madigan et al., 2015). The effect sizes for anxiety are shown in Figure 3. After discussing the use of the African Youth Psychosocial Assessment (AYPA) instrument with the authors of the O'Callaghan et al. (2013) study, a decision was made to exclude these results, as the AYPA did not differentiate between anxiety and depression symptom domains. A small significant pooled effect size for anxiety was observed ( $g = 0.30$ , 95% CI [0.10, 0.49],  $p = .003$ ). No heterogeneity was observed ( $Q = 1.12$ ,  $df = 3$ ,  $p = .773$ ,  $I^2 = 0.00%$ ).

#### 3.2.3 | Depression

While all 10 studies examined the pre- versus post-efficacy of psychological interventions compared to controls in reducing symptoms of depression, only nine unique results were reported (Auslander et al., 2017; Danielson et al., 2012; Foa et al., 2013; Ford et al., 2012; Goldbeck et al., 2016; Jensen et al., 2014; Madigan et al., 2015; Najavits et al., 2006; Shirk et al., 2014). As mentioned previously, results reported by O'Callaghan et al. (2013) were excluded due to the lack of

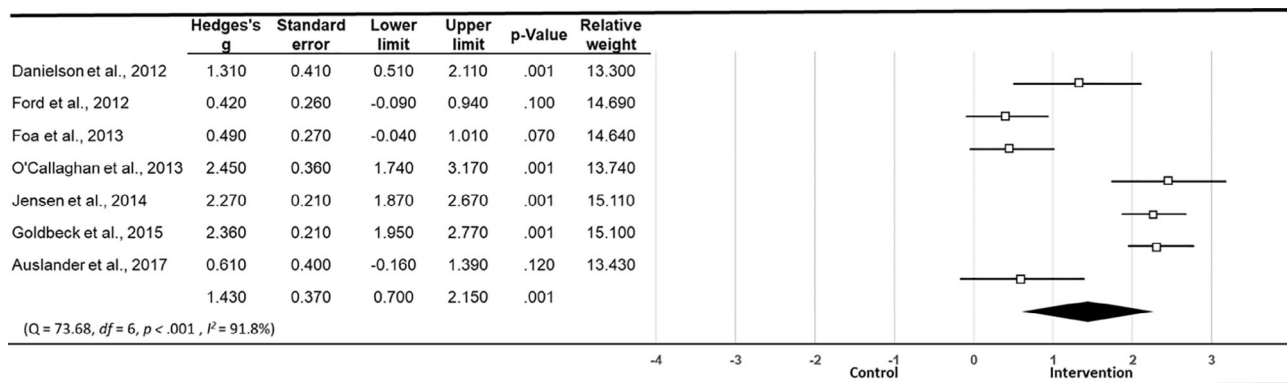


FIGURE 2 Effect sizes for PTSD ( $n = 7$ )

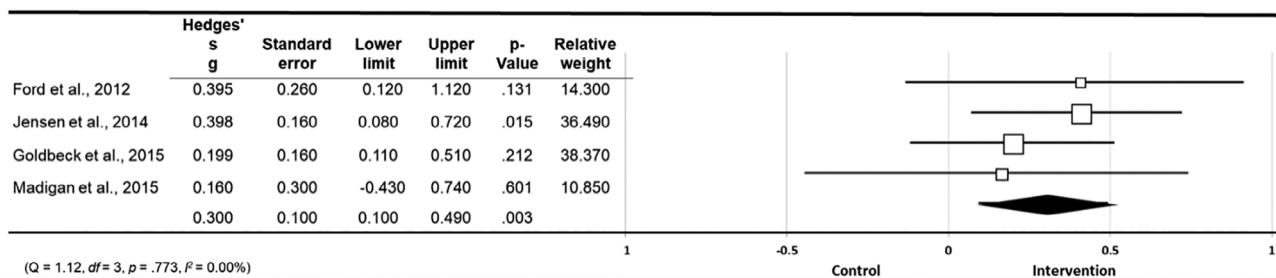


FIGURE 3 Effect sizes for anxiety ( $n = 4$ )

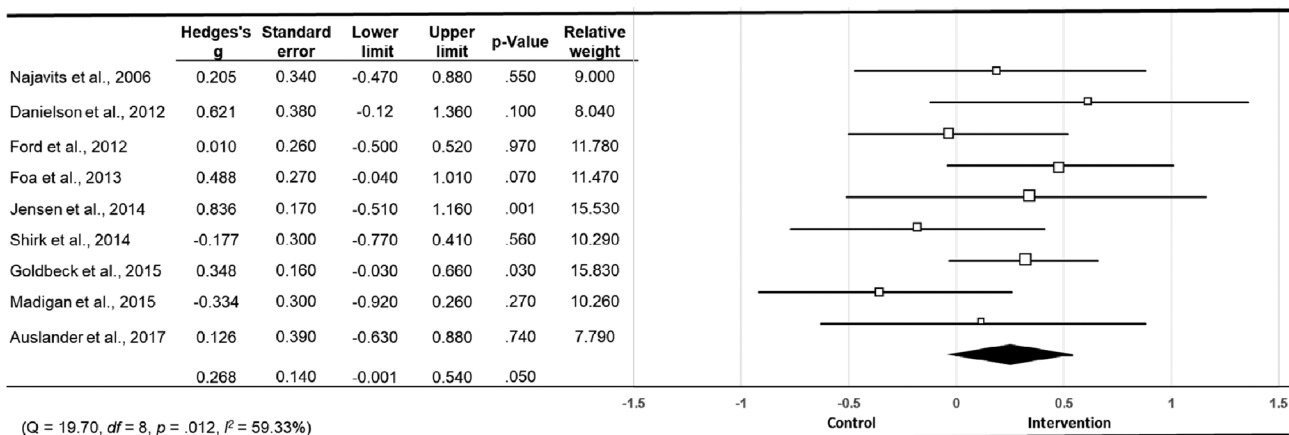


FIGURE 4 Effect sizes for depression ( $n = 9$ )

differentiation between anxiety and depression outcomes within the AYAP instrument. The summary of effect sizes is displayed in Figure 4. The pooled effect size for depression was small with trend-level non-significant results ( $g = 0.27$ , 95% CI [0.00, 0.54],  $p = .052$ ). Moderate heterogeneity was observed ( $Q = 19.70$ ,  $df = 8$ ,  $p = .012$ ,  $I^2 = 59.33\%$ ).

### 3.2.4 | Substance use

Two studies examined the pre- versus post-efficacy of psychological interventions compared to controls in reducing substance use (see Table S1). The summary of effect sizes is displayed in Figure 5. The pooled effect size for substance-use outcomes was medium ( $g = 0.67$ , 95% CI [0.11, 1.22],  $p = .018$ ), and moderate heterogeneity was observed ( $Q = 1.72$ ,  $df = 1$ ,  $p = .190$ ,  $I^2 = 41.83\%$ ). However, RRFT, which included elements of TF-CBT, (Danielson et al., 2012;  $g = 0.91$ , 95% CI [0.26, 0.38],  $p = .001$ ), which included elements of TF-CBT appeared to be more effective than SS (Najavits et al., 2006;  $g = 0.34$ , 95% CI [-0.33, 1.02],  $p = .319$ ) in reducing substance-use behaviours.

### 3.2.5 | Subgroup analysis

For exploratory purposes, separate analyses were conducted for studies that compared TF-CBT to other treatments (see Table S2 for

treatment types). Subgroup analyses were only conducted in cases where the two complementary groups included at least two studies each. As such, an exploratory subgroup analysis was only conducted for outcomes of PTSD and depression.

For PTSD, separating studies into these two groups reduced overall heterogeneity, resulting in significant outcomes for both the TF-CBT group (3 studies;  $g = 2.33$ , 95% CI [2.07, 2.60],  $p = .001$ ), and the other treatment group (4 studies;  $g = 0.61$ , 95% CI [0.30, 0.91],  $p = .001$ ). Low heterogeneity was noted in both the TF-CBT ( $Q = 0.22$ ,  $df = 2$ ,  $p = .896$ ,  $I^2 = 0.00\%$ ) and other treatment group ( $Q = 3.67$ ,  $df = 3$ ,  $p = .300$ ,  $I^2 = 18.21\%$ ). The test for variance between subgroups indicated that TF-CBT performed significantly better than other treatments ( $Z_{diff} = 8.43$ ,  $p = .001$ ).

For depression, separating studies into these groups did not reduce the overall heterogeneity any further. The subgroup analysis resulted in a medium and significant effect size for the TF-CBT group (4 studies;  $g = 0.62$ , 95% CI [0.42, 0.83],  $p = .001$ ) and a small non-significant effect size for the other treatment group (6 studies;  $g = 0.19$ , 95% CI [-0.06, 0.44],  $p = .128$ ). Heterogeneity remained high for the TF-CBT group ( $Q = 38.88$ ,  $df = 3$ ,  $p = .001$ ,  $I^2 = 92.26\%$ ), and was low for the other treatment group ( $Q = 4.55$ ,  $df = 5$ ,  $p = .473$ ,  $I^2 = 0.00\%$ ). The test for variance between subgroups indicated that there were no differences between the two treatment groups (TF-CBT and other treatments;  $Z_{diff} = 1.59$ ,  $p = .112$ ).

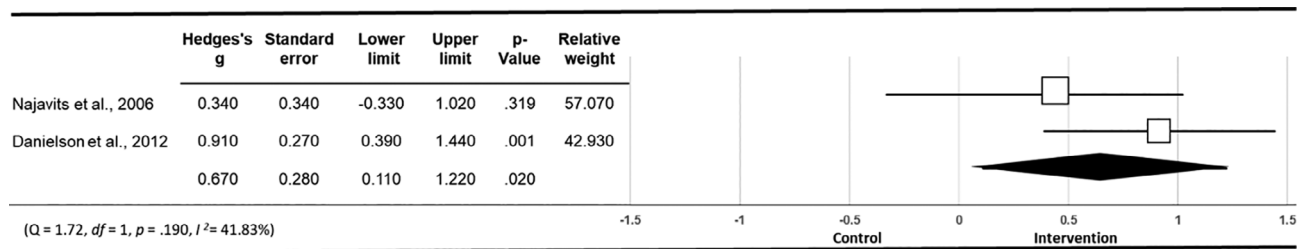


FIGURE 5 Effect sizes for substance use ( $n = 2$ )

## 4 | DISCUSSION

To the best of our knowledge, this is the first systematic review and meta-analysis to evaluate the efficacy of psychological interventions for young people (aged 12–25 years) following exposure to a broad range of interpersonal traumas. Findings extend previous meta-analytic research by focusing on the outcomes of psychological interventions on anxiety, depression, and substance use, in addition to PTSD. Additionally, in contrast to previous meta-analyses that reported outcomes following sexual and physical abuse for children and adolescents (Harvey & Taylor, 2010; Macdonald et al., 2012; Sanchez-Meca et al., 2011; Trask et al., 2011) or children, adolescents, and young adults (Gutermann et al., 2016; Wethington et al., 2008), this review focused on adolescents and young adults only and included a wide range of interpersonal trauma types.

This review found either statistically significant or trend-level efficacy in reducing PTSD, depression, anxiety, and substance-use symptoms, in its synthesis of literature of psychological interventions for the treatment of young people exposed to interpersonal trauma. Specifically, effect sizes were large for symptoms of PTSD ( $g = 1.43$ , 95% CI [0.37, 2.15],  $p = .002$ ), medium for substance-use behaviours ( $g = 0.67$ , 95% CI [0.11, 1.22],  $p = .018$ ) and small for anxiety ( $g = 0.30$ , 95% CI [0.10, 0.49],  $p = .003$ ) and depression ( $g = 0.27$ , 95% CI [0.00, 0.54],  $p = .052$ ). However, in most cases, wide confidence intervals were observed, providing only limited information on the true magnitude of the impact of these interventions on outcomes for anxiety, depression and substance-use. Only the result for PTSD had a lower confidence limit at more than a negligible effect, which suggest that the intervention produce at least a small effect for PTSD. It is important to note that similar point estimates but also wide CI have also been found in other meta-analyses for outcomes of PTSD following child sexual abuse in children and adolescents (Harvey & Taylor, 2010; Macdonald et al., 2012; Trask et al., 2011) as well as child sexual and physical abuse (Gutermann et al., 2016) in children, adolescents and young adults. Similarly, for anxiety, previous meta-analyses of children and adolescents reported small to medium effects with CI ranging from no effect to a medium effect (Macdonald et al., 2012; Sanchez-Meca et al., 2011). However, while our small, trend-level effect for depression is in line with point estimates reported in a meta-analysis that included young adults (Wethington et al., 2008), the CI reported in our analysis ranged from no to a medium effect while the CI reported by Wethington et al. (2008) in

the study of adolescents and young adults exposed to child sexual abuse ranged from small to a medium. Additionally, our results are not in line with the significant medium effect and tight confidence interval reported for depression in the meta-analysis of children and adolescents following exposure to sexual abuse (Sanchez-Meca et al., 2011). This suggests that PTSD treatments for children are better able to also address depression than they are for young people.

Our exploratory analyses for TF-CBT versus other treatments (which included a more heterogeneous group of interventions including CBITS, m-CBT, PE, RRFT, TARGET, PE, and RRFT) showed smaller confidence intervals than other analyses. This might suggest that wide confidence intervals and heterogeneity in this meta-analysis are being driven by varying intervention methods. These analyses also showed that TF-CBT performed significantly better than other treatments for PTSD. However, for depression there were no differences between TF-CBT and other treatments. Results for post-traumatic stress are in line with the practice guidelines from the International Society for Traumatic Stress Studies (Bisson et al., 2019), that recommend the use of TF-CBT or EMDR for the treatment of children and adolescents with PTSD following exposure to any trauma.

Current interventions developed for the treatment of post-traumatic stress share many core therapeutic components (i.e., psycho-education, behavioural and emotional regulation, coping skills training, and cognitive processing) that are also standard in CBT for anxiety and depression (Oud et al., 2019; Rith-Najarian et al., 2019). Results from this review and others (Macdonald et al., 2012; Wethington et al., 2008) indicate that these interventions are relatively ineffective in resolving comorbid anxiety and depression symptoms in young people with a history of interpersonal trauma, despite the overlap in conceptual approach. It is unclear from the reviewed studies how much time was devoted to different aspects of the treatment. It is possible that, although the treatments share components, less time and focus may have been dedicated to components that are known to be effective for depression and anxiety. For example, it is possible that psycho-education was more focussed on PTSD than depression or anxiety.

Furthermore, although planned treatment duration across studies ranged from eight (Foa et al., 2013) to 25 sessions (Najavits et al., 2006), actual treatment dose, measured as the number of sessions attended, ranged from five (Madigan et al., 2015) to 13 sessions (O'Callaghan et al., 2013), with a mean of 10 sessions across all studies. It is possible that little time would have been available to dedicate

to specific comorbid presentations in such time-limited interventions. Treatment protocols that stipulate more sessions focused on treatment components that are known to resolve depression and anxiety may improve outcomes. While there are presently insufficient data and lack of consensus about the ideal length of treatment (Cloitre et al., 2012), evidence suggests that young people impacted by childhood interpersonal trauma may need more treatment sessions than typically offered in standard treatment approaches (Bisson et al., 2019). Evidence also indicates that additional sessions should be provided using a flexible, patient-tailored model (Bisson et al., 2019), where interventions are matched to prominent symptoms, and where time is dedicated to address both post-traumatic and comorbid symptoms. Current practice guidelines recommend the use of evidence-based therapeutic approaches to attend to specific anxiety, depression, and substance-use symptoms and pharmaceutical approaches for the alleviation of persistent symptoms (Cohen, 2010; Keeshin et al., 2020).

#### 4.1 | Limitations and future directions

Several limitations of the current study should be noted. The review, which was not registered with PROSPERO at the time of its design, only included articles published in English and did not include open trials. It is noted that the inclusion of these additional studies may have yielded different findings. Overall, the number of studies that met our criteria was small ( $k = 10$ ). Heterogeneity was noted for PTSD and depression. While a subgroup analysis was conducted to explore heterogeneity, subgroup results need to be interpreted with caution given the small sample size and resulting lack of power. Additionally, most participants were female, and most studies were conducted in high-income countries, thus caution is required when applying the results to male participants and/or low- and middle-income settings. As such it will be important to update this analysis as more studies are published and as the quality of interpersonal trauma research, especially in terms of selection bias, improves.

To understand if differences exist in the treatment outcomes between young adults compared to children, adolescents, and adults, future research should focus on RCTs that include older adolescents and young adults, including populations with interpersonal trauma experiences beyond sexual and physical abuse. We recommend the inclusion of standardized clinician-administered and self-report assessments for anxiety, depression, and substance use in future studies of post-traumatic stress to fully quantify the implications of treatment outcomes on clinical practice. Additionally, a better understanding of the underlying mechanisms of therapeutic change is needed to help increase treatment efficacy with PTSD and comorbid symptoms, and to determine what type of therapeutic strategies and interventions benefit specific treatment populations. Future research could examine whether the order and application of different treatment components influences therapeutic change (i.e., for PTSD and associated comorbidities), and identify the length of treatment that yields maximum benefit. Further optimisation of outcomes could also

include the addition of an online treatment component (Vigerland et al., 2016), for which there is emerging evidence. Lastly, the development of clinician-friendly algorithms that identify preferential treatments based on young peoples' specific symptom presentation (e.g., Briere & Scott, 2015) would facilitate effective treatment matching in community clinics.

## 5 | CONCLUSIONS

The current meta-analysis provides some information about the symptom change that can be expected during psychological treatments for interpersonal trauma for young people. While promising trends were noted for post-traumatic and substance-use outcomes, results should be interpreted with caution given the wide confidence intervals and relatively small sample size. Intervention development is needed to adequately address the complex therapeutic needs of young people with a history of interpersonal trauma. To better understand the potential efficacy of psychological interventions for young people with commonly co-occurring problem syndromes, such as anxiety, depression, and substance use, future studies should focus on adolescent and young adult populations and collect quality outcome data using both standardized and self-report diagnostic instruments. Research should not only include larger samples of male populations but also focus on high-quality research from middle- and low-income countries.

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#### DATA AVAILABILITY STATEMENT

The data that support each step of the PRISMA flowchart is available from WP upon request.

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