Exploring factors that influence psychological wellbeing after childhood adversity

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Chapter 1

The Impact of the Victim-Perpetrator Relationship on Post-Traumatic Stress Disorder Symptom Severity in Childhood Sexual Abuse Victims: Systematic Review and Meta-Analysis

Prepared in accordance with the author requirements for Child Abuse and Neglect; author guidelines can be found here

Abstract

Background: One factor suggested to influence Post-Traumatic Stress Disorder (PTSD) severity in victims of childhood sexual abuse (CSA) is the victim-perpetrator relationship (VPR), particularly if the perpetrator is a family member or not.

Objective: This review aimed to examine the impact of the VPR on PTSD symptom severity.

Methods: This review was conducted in line with PRISMA guidance. Six major databases were searched on 7th September 2024. The primary author screened 100% of the study's titles and abstracts, followed by full text screening. For the included studies, relevant information was extracted, and quality of studies was assessed using the Crowe Critical Appraisal Tool (CCAT). 20% of studies were independently reviewed by a second reviewer at each stage. Findings were synthesised using a narrative approach, and for papers eligible for quantitative synthesis, a random effects meta-analysis was performed.

Results: Seventeen studies were eligible for inclusion. Narrative synthesis demonstrated that most studies presented non-significant relationships between the VPR and PTSD severity, across all operationalizations of the VPR (familial status, caregiver status or levels of relatedness). The meta-analysis of 12 eligible studies found a significant, but very small effect size overall. There was some initial evidence to suggest that there may be a difference in findings based on age of participants, with weaker effects noted for child samples.

Conclusions: This review has analysed the literature base exploring the VPR and suggests that this does not have a strong effect on PTSD severity after CSA, particularly in child samples.

Keywords: Child Sexual Abuse, Mental Health, Post Traumatic Stress Disorder, Victim-Perpetrator Relationship.

Introduction

Childhood sexual abuse (CSA) is forced or coerced sexual activity with a child or adolescent who is unwilling or unable to consent (American Psychological Association, 2012). This type of maltreatment is prevalent. Ranges reported vary depending on definition and location, mostly ranging between 8 to 31 percent of children experiencing CSA globally (Barth et al., 2013). CSA often, but not exclusively, occurs within familial relationships (Gold et al., 1996; Crisma et al., 2004).

CSA is a significant risk factor for many negative psychological, social and health outcomes (Leeb et al., 2011). Victims[1] of CSA often experience pervasive and severe mental health difficulties; one of the most common being Post-Traumatic Stress Disorder (PTSD), with as many as 88% experiencing symptoms (Carey et al., 2008). PTSD is a mental health disorder precipitated by a traumatic event and is characterised by re-experiencing (such as flashbacks or nightmares), avoidance, negative cognitions or affect, and hyperarousal (Cloitre et al., 2013).

While the high prevalence of PTSD after CSA is well established, the severity of PTSD symptoms experienced by CSA victims are variable. The literature is unclear on what factors moderate heterogeneity in PTSD severity; however, this likely includes the combined interaction of a variety of factors including victim characteristics, abuse specific factors ('trauma severity'), and post-abuse experiences (Nooner et al., 2012). A meta-analysis by Paolucci and colleagues (2001) explored the wide-ranging effects of CSA and suggested the

[1] A note on terminology: The author acknowledges recent discourse on terminology in sexual abuse research, as to whether 'victim' or 'survivor' is most appropriate (O'Shea et al., 2024). As this review is exploring a regularly used term of 'victim-perpetrator relationship', the authors will be using 'victim' throughout for continuity and to aid understanding.

abuse characteristic of perpetrator identity and the victim-perpetrator relationship (VPR) as an area that should be explored in more detail. Other reviews have also recommended that the type of VPR on outcomes should be explored further, particularly the effects of the perpetrator being a family member (Beitchman et al., 1991; Kendall-Tackett et al., 1993; Yancey & Hansen, 2010).

The Betrayal Trauma Theory (Freyd, 1996) provides a theoretical basis for the role of VPR in the severity of posttraumatic symptomatology in CSA victims, suggesting that the high levels of betrayal that may come when one is sexually abused by a family member may induce worse mental health outcomes than when abused by non-family members. The focus on PTSD symptom formation and severity stems from the hypothesis that dissociation is a protective mechanism that children rely on during intrafamilial abuse (given the child needs to rely on the perpetrator in daily life, such as when they are a close family member like a caregiver/parent) (Lawson & Akay-Sullivan, 2020). Dissociation involves the disconnection of oneself from their conscious experience (their thoughts, feelings, surroundings and identity; Serrano-Sevillano et al., 2017) and is implicated in the impairment of memory formation and development of PTSD (Breh & Seidler, 2007; Bedard-Gilligan & Zoellner, 2012). Therefore, it is hypothesized that with higher dissociation in the context of intrafamilial CSA, PTSD severity will be higher than in the context of extrafamilial CSA.

The literature has yet to review and synthesise the findings of studies that explore this topic and assess the effect of familial and/or caregiver status within the victim-perpetrator relationship on the severity of PTSD symptomatology. PTSD poses pervasive psychological and functional impacts on CSA victims (Jellestad et al., 2021). As such, it is important to

understand risk factors that may contribute to increased severity of symptoms to aid clinical and theoretical understanding.

The current review

The main aim of this review was to understand the effect of the VPR on PTSD severity in CSA victims. The primary research question is: Does the victim-perpetrator relationship, as defined by familial status/relatedness, impact on post-traumatic stress disorder symptom severity in victims of childhood sexual abuse?

Based upon scoping searches of the literature base, it is apparent that research articles differ in their definitions and classifications of the VPR, and to capture as much relevant data as possible this review prioritises familial status. However, some studies may operationalise this more specifically, such as by caregiver status. As this is expected, a secondary aim will be to explore how studies operationalise the VPR, and if differences in operationalization moderate the association with PSTD severity.

Method

Protocol

The protocol for this review was registered on PROSPERO on the 27th August 2024, and updated on 26th March 2025 (CRD42024570145) and was conducted in line with the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines (See Appendix 1.1, Page et al., 2021).

Eligibility Criteria

The eligibility criteria for this review are listed below.

Inclusion Criteria:

- Studies must explore the relationship between the victim-perpetrator relationship and PTSD symptom severity of participants who have experienced CSA.
- The study must compare the PTSD symptom outcomes between perpetrator types. This may be defined differently depending on the study; however, they must look at familial or caregiver status or familial relatedness (such as extra-familial versus intra-familial and caregiver versus non-caregiver).
- Sexual abuse experiences of participants occurred within childhood (under 18 years old), but participants may be adults or children. Defining the sample as CSA victims is acceptable, even if they do not state the specific age at which this occurred.
- PTSD symptom severity or symptom count is explicitly looked at using a quantitative measure, rather than broad negative outcomes such as mental health difficulties or 'trauma symptoms.'
- Research must be published in English.
- Research must be published in a peer reviewed journal.

Exclusion Criteria:

- Study not written in English or there is no English translation available.
- Study does not report PTSD symptom severity as a function of the relationship between victim and perpetrator.
- Any study that includes participants whose abuse history did not occur or start under the age of 18, or mixes adult and child abuse samples.
- Unpublished manuscripts, theses or other grey literature.

Search

The search strategy for this review was developed through scoping searches of relevant literature, and via consultations with the University of Glasgow's library service. Searches were conducted on six relevant electronic databases: PsycINFO, Embase, Web of Science Core Collection, MEDLINE, Applied Social Sciences Index and Abstracts (ASSIA) and Cumulated Index in Nursing and Allied Health Literature (CINAHL). Searches were run on 7th September 2024, with a review period between 1900 to 7th September 2024.

For a complete search strategy for each database used, please see Appendix 1.2. In summary, the following key search terms and areas were used; (Child* Sex* Abuse* OR Child* Sex* Trauma OR Sex* Abuse* OR CSA OR Molest* OR Child* Porn*) AND (Post Traumatic Stress Disorder OR PTSD OR Post Traumatic Stress Symptom*) AND (Victim Perpetrator Relationship OR Child Perpetrator Relationship OR Relationship to Perpetrator OR Relationship to Abuser OR Perpetrator Identity OR Incest* OR Extra familial OR Intra familial OR Trauma characteristics OR Abuse characteristics OR Crime characteristics)

Study Selection

Search findings were exported into EndNote and de-duplicated using EndNote's automated function. This was then screened manually, and any additional duplicates were removed. The lead researcher screened all title and abstracts for eligibility as per inclusion and exclusion criteria. The second reviewer, a trainee clinical psychologist, screened 20% of titles and abstracts, with 96% inter-rater agreement. Any discrepancies were resolved via discussion. Full text screening was undertaken by the lead researcher, and then followed by the second reviewer screening 20% of papers, with 100% agreement between reviewers. Exclusion reason was recorded at this stage and can be seen within the PRISMA diagram

(Figure 1). Additionally, reference lists of included papers were screened by the lead researcher to ensure eligible papers were not missed.

Data Extraction

A data extraction table was created and summarized in tabular format. The following information was sought from all included papers:

1) Study Characteristics: author, publication year, country.
2) Sample Characteristics: sample size, age and sex.
3) Operationalisation of the VPR; for example, intra and extra-familial/familial status, parent or non-parent/caregiver status, or level of relatedness.
4) PTSD outcome measure used.
5) Summary of Findings.

A second reviewer, a research assistant, independently conducted data extraction of 4 (>20%) included studies to ensure accuracy, with no concerns noted.

Quality Appraisal

The Crowe Critical Appraisal Tool (CCAT; Crowe, 2013) was used to assess quality of eligible studies by the lead researcher. This tool assesses eight areas, with a scoring system of 0-5 (with zero being the lowest quality): Preliminaries, introduction, design, sampling, data collection, ethics, results and discussion. Scores are summed and expressed as a percentage total quality. The categorisation of quality is classified as 'high' (>75% or total score of 30 +), 'moderate' (50-75%, or total score of 20-30), and 'low' (<50% or <20 total score). A second reviewer, a research assistant, completed quality appraisals of 4 included studies. Inter-rater agreement for this process was 100%, whereby final quality classification was the same for each study rated. For each of the eight areas assessed, there was no more than one-

point differences between raters, and for total score, there was no more than two-point differences overall.

Synthesis

Studies included in this review were explored initially using a descriptive, narrative synthesis approach (informed by Popay et al., 2006). This included examining the similarities and differences between studies in terms of their findings related to the effect of the VPR on PTSD symptom severity in victims of CSA, their use of PTSD outcome measures, and their operationalisation of the VPR. Variability of results across studies was discussed in relation to above factors. Additionally, quality across studies was reviewed and summarized.

A meta-analysis of correlations was completed with a subset of eligible studies from this review, using the R package metafor in RStudio (R version 4.33, R Core Team, 2024). Correlation coefficients were extracted for each study where available. For those using alternative statistics, an online calculator was used to convert these to r (Lenhard & Lenhard, 2022). A random-effects model was used to allow for heterogeneity of parameters and data between studies (Vevea & Coburn, 2015). Individual correlation coefficients were transformed into Fisher's z in order to complete the meta-analysis and subsequently transformed back into r coefficients to allow for interpretation. Heterogeneity was also assessed using Cochrane's Q test and I^2 percentage (as per Higgins et al., 2003). If heterogeneity was large, influential cases were investigated through Baujat plots (Baujat et al., 2002) and outliers detected if the individual study's 95% confidence interval did not overlap with the confidence interval of the overall pooled effect (Harrer et al., 2021). Outliers as determined by the above analysis were removed from final meta-analysis.

The individual and combined correlations, along with 95% confidence intervals were visualised using a forest plot. Effect sizes were used to evaluate the magnitude of the effect, using Cohen's criteria (Cohen, 1988; small (r=.10–.29), medium (r=.30–.49) and large (r≥.50)). Additionally, moderator analyses were undertaken to examine if the operationalisation of the VPR, and age of participants, impacted the results. This was conducted using a mixed-effects model with the omnibus Q_M test.

Results

On 7th September 2024, the searches across all chosen databases were completed. As shown in Figure 1 below, 1,389 papers were identified from the searches, and after de-duplication, 651 papers remained. These were screened at title and abstract level, followed by full text screening of 137 studies. 17 studies were eligible for inclusion in this review. Table 1 provides an overview of included studies.

Figure 1 *PRISMA Flow Diagram (from Page et al., 2021)*

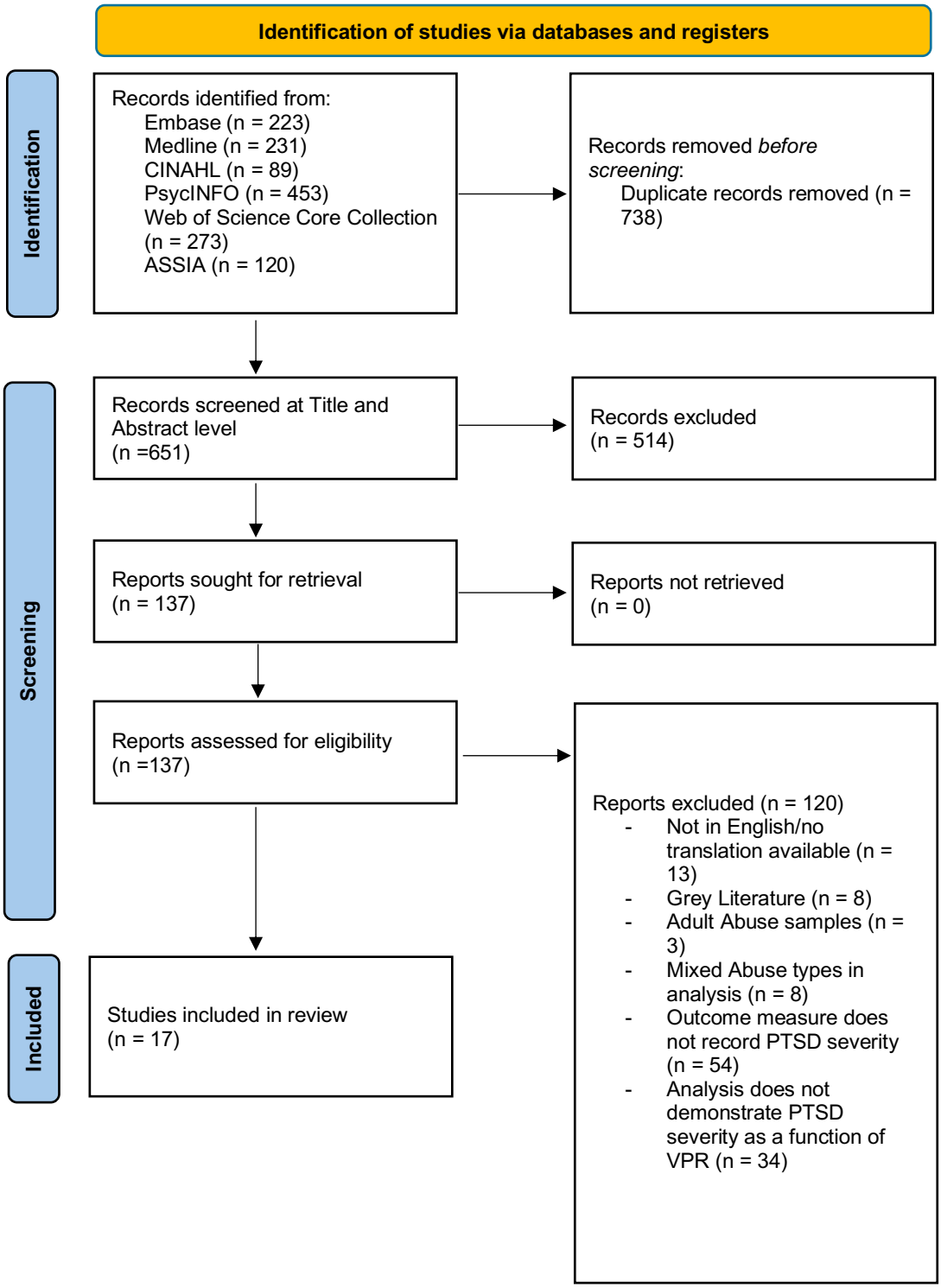


Table 1 *Characteristics and Findings of Included Studies*

ID	Authors & Year	Region	N	Age Range (years)	Gender (% Female)	Operationalisation of VPR groups	PTSD Severity Measure	Finding*
1	Arata, 1998	USA	204	17 - 47	100%	Level of Relatedness (4 groups)	Impact of Events Scale (IES; Horowitz, Wilner & Alvarez, 1979)	Positive association
2	Bal et al., 2004	Belgium	100	11 - 18	87%	Intra and Extra-Familial	PTSD subscale of Trauma Symptom Checklist for Children (TSCC; Briere, 1996; Dutch translation by Bal, 1998, unpublished).	No significant association
3	Boney-McCoy & Finkelhor, 1995	USA	132	10 - 16	72%	Level of Relatedness (4 groups)	Modified version of the Symptom Checklist-90&-Revised (SCL90-R; Derogatis, 1977; modified by Saunders, Arata, & Kilpatrick, 1990), reflecting PTSD symptoms specified in the DSM-IV.	No significant association
4	Collin-Vezina & Hebert, 2005**	Canada	67	7 - 12	100%	Intra and Extra-Familial	Children's Impact of Traumatic Events Scale—Revised (CITES; Wolfe, 1996)	No significant association
5	Gauthier-Duchesne et al., 2017	Canada	447	6 - 12	71%	Level of Relatedness (4 groups)	Children's Impact of Traumatic Events Scale II (CITES-II; Wolfe, 2002)	No significant association

6	Greenwald & Leitenberg, 1990	USA	54	23 - 61	100%	Level of Relatedness (3 groups)	Authors created questionnaire corresponding to DSM-III-R criteria for PTSD.	Positive association
7	Guerra et al., 2018	Chile	106	12-17	100%	Level of Relatedness (4 groups)	Child PTSD symptom scale (Foa, Johnson, Feeny, & Treadwell, 2001) Chilean Adaption (Bustos, Rincón, & Aedo, 2010)	Negative association
8	Ironson et al., 2019	USA	290	19-67	0%	Intra and Extra-Familial	The Davidson Trauma Scale (Davidson et al., 1997)	Positive association
9	Johnson et al., 2001	USA	89	18-56	100%	Caregiver Status	Clinician administered PTSD Scale (CAPS-SX; Blake et al., 1996)	No significant association
10	Kiser et al., 2014**	USA	1501	6 - 18	79%	Caregiver Status	UCLA PTSD Reaction Index for DSM-IV (UCLA PTSD-RI; Steinberg et al., 2004)	Negative association
11	Lev-Wiesel et al., 2005	Isreal	93	No range reported. M= 24.96 (SD = 4.45)	100%	Intra and Extra-Familial	17-item PTSD inventory based on DSM-III-R criteria for PTSD	Positive association
12	Lev-Wiesel & Markus, 2013	Isreal	225	No range reported. M=30 (SD =	100%	Intra and Extra-Familial	A Post Traumatic Stress Disorder Symptom Scale based upon DSM-IV PTSD symptoms.	No significant association

				4.9)				
13	Lucenko et al., 2000***	USA	67	18 - 58	100%	Intra and Extra-Familial *and* Caregiver Status	Impact of Event Scale. The Impact of Event Scale (IES) (Horowitz et al., 1979)	For family status operationalisation, there was no significant association. For caregiver status, there was a negative association.
14	Maikovich-Fong & Jaffee, 2010	USA	423	4-16	72%	Intra and Extra-Familial	PTSD subscale of the Trauma Symptom Checklist for Children (Briere, 1996).	No significant association
15	McLean et al., 2014**	USA	83	13 - 18	100%	Level of Relatedness (3 groups)	Child PTSD symptom scale (Foa, Johnson, Feeny, & Treadwell, 2001)	No significant association
16	Rahm et al., 2012	Sweden	87	19 - 67	100%	Level of Relatedness (3 groups)	The Impact of Event Scale Revised (IES-R) (Horowitz et al., 1979)	No significant association
17	Ullman, 2007**	USA	148	No range reported. M= 19.57 (SD=2.44)	71%	Intra and Extra-Familial	Foa's posttraumatic stress symptom severity scale (Foa, 1995)	Positive association

*Association was defined based on this review's research question; therefore 'positive association' refers to higher PTSD severity being associated with higher degrees of relatedness/familial status, and 'negative association' refers to higher PTSD severity being related to lesser degrees of relatedness/non-family status.

**Indicates studies not included in meta-analysis. Reasons for exclusion; statistics available did not allow for transformation of effect size (Ullman, 2007; Kiser et al., 2014; McLean et al., 2014) and analysis strategy not clear or specific enough for transforming effect size (Collin-Vezina & Hebert, 2005).
***Lucenko et al., (2000) provided statistics for two characterisations of the VPR (caregiver status, and familial status). These results included the same group of participants, and therefore only one analysis was included in further analysis and synthesis. The analysis for the familial status characterisation was prioritised, given that this is the one prioritized for this systematic review.

Overview of Studies

Seventeen studies met inclusion criteria for this review, dating from 1990 to 2019. Sample sizes of included studies ranged from 54 to 1501 participants; the total participants across all studies were 3946. Across studies, age of participants ranged from 4 to 67 years, with nine [1, 6, 8, 9, 11, 12, 13, 16, 17] having adult samples and eight [2, 3, 4, 5, 7, 10, 14, 15] having child samples. The most common region/country was the USA, with 10 studies [1, 3, 6, 8, 9, 10, 13, 14, 15, 17]. The majority of samples had a higher proportion of female participants; with ten studies having 100% female samples [1, 4, 6, 7, 9, 11, 12, 13, 15, 16] and six studies having 71 – 87% females [2, 3, 5, 10, 14, 17]. One study had a solely male sample [8].

VPR operationalisation

As expected from scoping searches, VPR operationalisation differed between studies. Most commonly, eight of the included studies characterised their VPR and associated analyses as intra- or extra-familial perpetrators/familial status [2,4,8,11,12, 13 14 ,17]. Seven studies characterised VPR using multiple levels of 'relatedness' based upon how related a victim was to their perpetrator [1, 3, 5, 6, 7, 15, 16]. For example, one study used a scale of relatedness that ranged from 1 to 3, whereby 1 = unrelated, unknown perpetrator, 2 = perpetrator outside the family but known by victim, and 3 = perpetrator within the family [7]. The least utilized operationalization was when VPR was based on whether the perpetrator was the victim's caregiver or not, used in three studies [9, 10, 13]. One study [13] used two configurations of VPR, both caregiver status and intra-/extra-familial operationalisation.

Measure of PTSD severity

The most used measure of PTSD symptom severity was the Impact of Events Scale (IES; Horowitz, Wilner & Alvarez, 1979), with three studies utilising the adult scale [1, 13, 16] and 2 using the equivalent for children (Children's Impact of Traumatic Events Scale; Wolfe, 1996 or CITES-II; Wolfe, 2002) [4, 5]. Three studies used Foa's PTSD measures for adults (Foa, 1995) [17] and children (Foa, Johnson, Feeny, & Treadwell, 2001) [7, 15]. Two studies used the PTSD subscale of the Trauma Symptom Checklist for Children (TSCC; Briere, 1996) [2, 14]. The UCLA PTSD Reaction Index (Steinberg et al., 2004), the Clinician administered PTSD Scale (Blake et al., 1996), The Davidson Trauma Scale (Davidson et al., 1997) had one use each in the included studies [10, 9 and 8 respectively]. Study 3 used a modified version of the Symptom Checklist-90-Revised (SCL90-R; Derogatis, 1977), reflecting PTSD symptoms. The remaining studies used quantitative measures created to mirror criteria for PTSD based upon various editions of the Diagnostic and Statistical Manual of Mental Disorders (DSM) relative to the date of the study [6, 11, 12].

Quality Appraisal

Table 2 summarises the findings from the quality appraisal of the studies included in this systematic review. Of the 17 studies, six were rated as high quality and 11 were rated as moderate quality. The two lowest scoring (Lucenko et al., 2000 & Lev-Weisel et al., 2005), while not the oldest included studies, may have followed reporting guidance more appropriate to the time in which they were published. No studies were rated as poor quality, and all studies were eligible to be included in further synthesis.

Generally, the preliminary, introduction and discussion sections of the studies were of a moderate to high quality, and provided good justification of aims, background information and implications. Most commented on the limitations of their design and findings. The majority of included studies used reliable and validated outcome measures. The poorest

scoring section for the majority of studies was during their consideration of ethical matters, providing limited information, despite the topic area being a highly sensitive matter. No studies provided sample size calculations. Most studies did not explicitly state their chosen methodological design, but all provided enough information to convey their design (e.g. cross sectional or cohort).

Relationship between VPR and PTSD severity

Five studies found a significant positive relationship between the VPR and PTSD severity of the victim, meaning the more closely related (in terms of closeness, family vs non-family, or caregiver vs non-caregiver), the more severe the reported PTSD symptoms [1, 6, 8, 11, 17]. Of those studies, two used levels of relatedness [1,6], three used familial status [8, 11, 17], and none used the caregiver status operationalization. Regarding age of participants, all of the studies that found a positive association between VPR and PTSD severity used adult samples.

Two studies found a significant negative relationship (meaning the less related the perpetrator and victim were, the more severe PTSD symptoms the victim experienced) [7, 10]. Of those studies, one used level of relatedness [7], none used familial status, and one used the caregiver status operationalization [10]. Regarding age of participants, both studies that found negative associations between VPR and PTSD severity used child samples.

The majority of studies did not find a significant association between VPR and PTSD severity [2, 3, 4, 5, 9, 12, 13, 14, 15, 16]. Of those studies, four used levels of relatedness [3, 5, 15, 16], five used familial status [2, 4, 12, 13, 14], and one used the caregiver status operationalization [9]. Regarding age of participants, four of the studies that did not find a

significant association between VPR and PTSD severity used adult samples [9, 12, 13, 16] and six used child samples [2, 3, 4, 5, 14, 15].

Table 2 *Quality Appraisal of Included Studies Using the CCAT (Crowe, 2013)*

ID	Authors	Year	Prelimina-ries	Introduction	Design	Sampling	Data Collection	Ethical Matters	Results	Discussion	Total Score /40 (%)	Quality Rating
1	Arata	1998	4	5	4	2	3	1	4	5	28 (70)	Moderate
2	Bal et al.,	2004	4	5	5	4	4	4	4	4	34 (85)	High
3	Boney-McCoy & Finkelhor	1995	4	5	4	3	3	2	4	5	29 (72.5)	Moderate
4	Collin-Vezina & Hebert	2005	3	4	4	3	2	0	4	3	23 (57.5)	Moderate
5	Gauthier-Duchesne et al.,	2017	5	5	4	4	4	4	4	4	34 (85)	High
6	Greenwald & Leitenberg	1990	3	3	3	2	3	2	4	4	24 (60)	Moderate
7	Guerra et al.,	2018	5	5	4	4	4	4	4	5	35 (87.5)	High
8	Ironson et al.,	2019	4	4	3	4	3	1	4	4	27 (67.5)	Moderate

9	Johnson et al.,	2001	4	3	4	3	3	2	3	4	26 (65)	Moderate
10	Kiser et al.,	2014	4	5	4	4	3	1	4	5	30 (75)	High
11	Lev-Wiesel et al.,	2005	3	3	3	2	2	0	3	2	21 (52.5)	Moderate
12	Lev-Wiesel & Markus	2013	4	4	4	3	4	3	4	5	31 (77.5)	High
13	Lucenko et al.,	2000	3	3	4	3	3	0	2	3	21 (52.5)	Moderate
14	Maikovich-Fong & Jaffee	2010	4	4	4	4	3	4	3	4	30 (75)	High
15	McLean et al.,	2014	4	4	4	3	4	1	3	3	26 (65)	Moderate
16	Rahm et al.,	2012	4	4	3	3	4	4	3	4	29 (72.5)	Moderate
17	Ullman	2007	3	4	4	3	4	2	3	4	27 (67.5)	Moderate

Meta-analysis

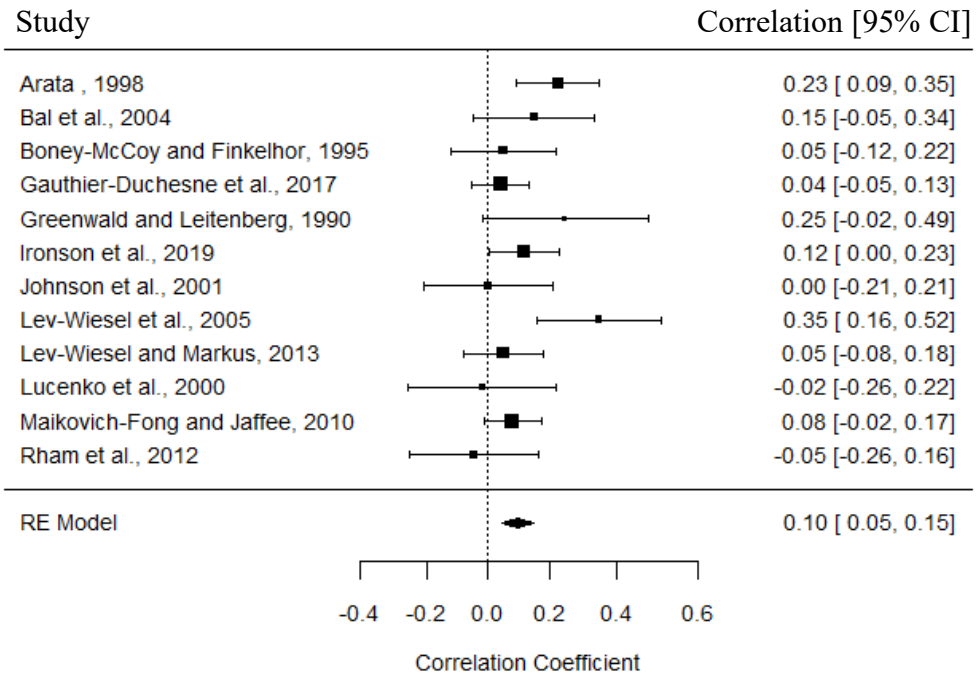
For a subset of studies, a meta-analysis was conducted to examine combined correlation estimate of the relationship between the VPR and PTSD severity. As explained above, four studies were not included in the meta-analysis (Collin-Vezina & Hebert, 2005; Ullman, 2007; Kiser et al., 2014; McLean et al., 2014) due to being unable to transform effect sizes from the available statistics and numerical data. Using the sample of 13 eligible studies, we ran an initial random-effects meta-analysis, which provided a pooled correlation of r = 0.08, p = 0.05, 95% CI = -0.00, 0.15 (see Appendix 1.4 for forest plot). The level of heterogeneity in this model was significant (Q = 31.08, p <.01) and the I^2 was found to be 67.41%, suggesting a moderate to high level of heterogeneity. As such, influential cases were inspected using a Baujat plot and the CIs of individual studies inspected in the forest plot. The study by Guerra et al., (2018) [6] was an influential outlier in the Baujat plot, and CI for this study did not overlap with the overall confidence interval of the overall pooled effect. Therefore, the decision was made to remove this study from the analysis.

The final meta-analysis included 12 studies (see Figure 2 for the forest plot). The heterogeneity of the final sample of papers included in the meta-analysis was calculated, and the I^2 was 29.99%, suggesting low to moderate level of heterogeneity (as per Higgins et al., 2003) and the Q test was also not significant (Q =17.53, p = .09). To explore publication bias, the funnel plot was inspected and appeared symmetrical. Additionally, neither Egger's regression test (b = 0.057, p = .59) nor Rank correlation test (τ=0.03, p = .95) were statistically significant, indicating no publication bias in included studies.

The meta-analytical results for the association between the Victim-Perpetrator Relationship and PTSD severity provided a combined correlation of r = 0.10, 95% CI = .05, .15,

representing a significant but very small, positive effect ($p < 0.001$). This is visualised in the Forest plot below (Figure 2). This analysis included data from a pooled total of 2022 participants.

Figure 2 *Forest Plot for Random Effects Size Meta-Analysis of PTSD Severity as a function of VPR*



As studies differed in their operationalisation of the VPR, further moderator analysis was conducted to examine if this impacted findings. The study by Johnson and colleagues (2001) [9] was removed from this analysis, as it was the only remaining study included in the meta-analysis that operationalised VPR by caregiver status. Results showed that operationalisation of VPR by either level of relatedness or familial status (extra- or intra-familial perpetrator) was not a significant moderator, therefore there was no evidence for significant differences between subgroups ($Q_M = 0.09$, $p = .76$).

Additional moderator analysis was conducted to examine the effect of participant age (whether the studies used a child or adult sample) on findings of the 12 eligible studies.

Results from the mixed-effects model showed that 'participant age' was not a significant moderator of the study's PTSD severity and VPR correlational findings ($Q_M = 0.94$, $p = .33$). However, when exploring subgroup differences (as shown in Table 3), it suggests that studies using adult samples demonstrated a higher effect size.

Table 3 *Moderator analysis results*

	r (estimated)	95% CI	*p*	*p* (subgroup)
Relationship Operationalisation				0.76
Familial Status (k = 6)	0.12	0.03 – 0.19	<0.001	
Relatedness Levels (k = 5)	0.10	0.002 – 0.19	<0.05	
Participants Age				0.33
Child (k = 4)	0.07	-0.01 – 0.15	0.08	
Adult (k = 8)	0.12	0.05 – 0.19	<0.001	

Discussion

This review synthesized findings from 17 studies that have explored the relationship between the VPR and severity of PTSD symptoms experienced by victims of CSA. Based upon a narrative review, most of the studies did not find a significant association between VPR and PTSD symptom severity, and a meta-analysis of a subset of studies (k = 12) found a very small, positive association. This finding does not provide strong evidence for the Betrayal Trauma Theory (Freyd, 1996), as it relates to PTSD symptomatology, whereby the expectation is that CSA perpetrated by someone trusted (e.g. a family member) would influence poorer mental health outcomes in victims (in this case, the outcome being PTSD

severity). This review contributes to a widening evidence base exploring the mental health outcomes after CSA and advances our understanding of what impacts (or not) the variability of such outcomes.

Based on the findings from this review, there is no strong evidence in support of the hypothesis that VPR is associated with PTSD symptom severity. This was consistent across operationalizations of the VPR. The association between VPR and PTSD symptom severity after CSA is therefore not straightforward. As such, it is important to contextualise this finding in relation to the other factors that are thought to impact on PTSD symptomatology. In the literature, VPR is one of many abuse related characteristics that contributes to overall 'trauma severity' (Fassler et al., 2005). Other factors that may make abuse, and its mental health outcomes, more severe include multiple perpetrators, chronicity of abuse/multiple episodes, acts during abuse (e.g. contact versus non-contact), and threat of violence (Zink et al., 2008). Often these factors can be interlinked with one another, for example, intra-familial abuse tends to occur for longer periods of time, at a higher frequency, and have an earlier onset than CSA perpetrated by offenders outside of the family (Fisher & McDonald, 1998). Further exploration is needed to disentangle the individual contributions of these factors on PTSD after CSA, and how those may interact with the VPR to effect outcomes.

This review prioritised familial status as its focussed conceptualisation of VPR. This decision was based upon both Betrayal Trauma Theory and availability of research in the area; as scoping searches revealed studies tended to be broad in their description of VPR (e.g. intra-familial or not, incest or not). It may be that this is not the most inclusive way to conceptualise the VPR and capture its impact on PTSD symptoms. There are multiple other VPR configurations that family and caregiver status or level of relatedness does not include,

such as perpetrators who are in other positions of trust like teachers or clergy (Dressing et al., 2017). Perhaps methodologies that are inclusive of multiple types of VPR configurations would be more insightful, such as level of perceived betrayal (see Edwards et al., (2012) for an example of a study that uses high and low betrayal as a moderating variable) or subjective closeness (Dimitrova et al., 2009). These methods would allow for participants to convey how they interpreted their individual relationship to the perpetrator, and therefore, may be more meaningful ways of capturing the nature of the relationship.

From the narrative synthesis we can see that all the studies that found a positive association used adult samples, and the two that found a negative association used child samples. Additionally, while the moderator analysis did not find a significant overall effect for age of participants (potentially due to being underpowered), there was some suggestion that studies with adult samples found bigger effect sizes. This of course needs to be contextualised by the finding that most studies (child and adult) found no association between VPR and PTSD severity, however, it may suggest that age at study participation is a factor that should be considered further. Adults who report current symptomatology have a higher likelihood of having been exposed to further adversities; multiple re-victimisation or high cumulative trauma exposure (Rizeq & McCann, 2023) could potentially lead to more severe negative outcomes. Additionally, there may be developmental differences in how CSA perpetrated by a family member is appraised in childhood, not far removed from the time of the abuse, versus in adulthood. Meaning making develops throughout adolescence into adulthood, and thus appraisals of betrayal and how traumatic CSA experiences were, may change over time (Miller & Widom, 2024). This could be an important consideration for future research to help us understand mechanisms and pathways to PTSD severity across the lifespan.

Limitations and Future Directions

The samples in this review were primarily female participants, with a small proportion of male participants. Although CSA rates tend to be higher in females, it is still relatively common in males (Stolenborgh et al., 2011) and PTSD after CSA has also been suggested to affect boys and girls at similar rates (Boumpa et al., 2024). Due to lack of studies with male participants, the findings are limited in their generalizability to males with CSA histories. Similarly, the majority of studies in this review were conducted in North America and limits our understanding of the relationship between the VPR and PTSD severity in other areas. Overall, future research would benefit from more diverse samples.

Conclusion

This review has collated and analysed the existing literature base exploring the VPR, as defined by familial status and relatedness, and suggests that this does not have a strong effect on PTSD severity after CSA, particularly in child samples. It will be important to further investigate CSA outcomes across the lifespan to delineate developmental differences in outcomes and to better understand mechanisms that underlie mental health in those affected by CSA.

Statements and declarations

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Chapter 2

A longitudinal study examining emotional, behavioural and attachment disorder symptoms of care-experienced young children: the role of early adversity and age at entry to care.

Prepared in accordance with the author requirements for Research on Child and Adolescent Psychopathology; author guidelines can be found here

Plain Language Summary

Title: A longitudinal study examining emotional, behavioural and attachment disorder symptoms of young children in foster care: the role of early adversity and age at entry to care.

Background: Children in the social care system (e.g. foster care) typically have histories with high rates of adversity, including abuse, neglect, parental substance abuse problems and domestic violence (Dorsey et al., 2012). Despite a large proportion of children entering care at a very young age (Pearson et al., 2020), very little research has studied the adversity histories of under 5's in care and explored how this impacts their mental wellbeing.

Aims: This study aimed to understand the pre-care adversity histories of young children in foster care. Additionally, we aimed to explore the impact of pre-care adversity and the age at which a child enters care, on symptoms of relational disorders and emotional and behavioural difficulties of young children in foster care over time.

Methods: Participants were recruited as part of the Best Services Trial (BeST?) and included children aged zero to five entering foster care in London and Glasgow and their carers. For this study, only data for participants from Glasgow was utilized due to availability of pre-care adversity information from social work records. This subset included 378 children and carers, with outcome data collected using questionnaires and interviews over two timepoints; a few weeks after entering care, and again after 2.5 years in care.

Main Findings and Conclusions: Despite their young age, children in this study had experienced a very high amount of adversity prior to entering foster care. The number of adversity types, and the severity of such, were higher the older a child was when entering care. Emotional and behavioural difficulties after 2.5 years in foster care was predicted by the number of different types of adversity a child experienced. Promisingly, symptoms of

relational disorders were lower following 2.5 years spent in foster care as compared to levels at entry to care. Our results show that early identification of adversity, as well as specialised support for care experienced children, is essential.

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Abstract

Background: Care-experienced children are known to have histories of adverse childhood experiences (ACEs). Exposure to adversity is well known risk factors for negative outcomes across the lifespan. However, very little is known about the adversity histories of young children in care, and how this may affect their emotional, behavioural, and attachment disorder outcomes over time.

Methods: Data from 378 young children in foster care, aged 0 – 5 years old, as part of the Best Services Trial (BeST?) were used. Adversity experiences were identified and coded by two independent reviewers from social care records. Age at entry to care was also recorded. Outcome variables included emotional and behavioural difficulties and attachment disorder symptoms measured at two timepoints (a few weeks after entering care, and 2.5 years later).

Results: The number of ACEs in this sample was high, with two thirds of children having experienced 4 or more. The older the age at which a child entered foster care was strongly related to higher number of ACEs, and increased severity of maltreatment, experienced. An increase in emotional and behavioural difficulties after 2.5 years in foster care was significantly uniquely predicted by the number pre-care ACEs a child experienced. Attachment disorder symptoms were significantly lower at 2.5 years in care as compared to levels at entry to care.

Conclusions: These findings indicate that prevention and early identification of risk in vulnerable families is paramount. Additionally, tailored interventions for the emotional and behavioural wellbeing of young children in care is essential.

Keywords: Foster Care, Mental Health, Attachment, Adverse Childhood Experiences.

Introduction

In the UK, approximately one percent of children are care-experienced, with the majority living in foster care (Office for National Statistics, 2023). A large proportion of those children first enter care under the age of one (Pearson et al., 2020), and rates are expected to increase due to cases of newborn care entrants rising (Bilson & Bywaters, 2020). The mental health of young children is a growing area of interest in psychological research, given it is a developmentally unique time for a child's wellbeing, where a child's brain is vulnerable and receptive to change based upon their experiences (Clinton et al., 2016). Therefore, the emotional and behavioural wellbeing of young children, particularly those who have experienced adversity, is a global research priority (Lyons-Ruth et al., 2017).

Children may enter care for several reasons but will commonly have experienced adverse childhood experiences (ACEs). ACEs are highly stressful events, and include maltreatment (emotional, physical or sexual abuse, or neglect), domestic violence and parental mental health or substance misuse problems (Felitti et al., 1998). Around 90% of care-experienced populations will have experienced at least one ACE (Dorsey et al., 2012; Stein et al., 2001). Data from young (under 5 years) care-experienced children are scarce, but initial research suggests that pre-care adversity for younger children may be characteristically different from those who are older. Palusci (2011) suggests that in children younger than five, documented experiences of physical, sexual, and emotional abuse are relatively low, whereas neglect is more prominent. These children were more likely to have foetal drug exposure, families with addiction difficulties and domestic violence (Palusci, 2011). A recent review of children born into care in Scotland found that these families had complex needs, including poverty, housing problems, parental mental health issues, substance misuse, domestic violence and criminal justice involvement (Cusworth et al., 2022).

Impact of Adversity on Attachment Disorders and Behavioural and Emotional Wellbeing

Early exposure to abuse and neglect by caregivers and disruption in care can contribute to a sense of insecurity and lack of safety in child-caregiver relationships and result in significant developmental, emotional, behavioural and relational difficulties (for meta-analyses see Baer & Martinez, 2006; Vasileva & Petermann, 2016). With repeated exposure to stressors, some children may go on to develop attachment disorders (i.e. Reactive Attachment Disorder (RAD) and Disinhibited Social Engagement Disorder (DSED)), whereby the patterns of behaviour become pervasive across various relationships (Zeanah, 1996; Román et al., 2022). The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) states that attachment disorders are directly related to exposure to maltreatment and that difficulties arise before age five (American Psychiatric Association, 2013). Children with RAD find it difficult to form, seek and accept closeness from others, showing heightened behavioural outbursts emotional dysregulation, and fearfulness of others (American Psychiatric Association, 2013). A child with DSED will demonstrate indiscriminate behaviour towards adults, such as willingness to leave caregivers for other adults or engage in familiar behaviour (e.g. hugging) with strangers (American Psychiatric Association, 2013). Research suggests a prevalence rate of attachment disorders of between 1 – 2% in the general population (Minnis et al., 2013). Exposure to ACEs generally, beyond maltreatment, has also been linked to higher risk of attachment disorders and emotional and behavioural problems in children (e.g., Freeman, 2014; Ray et al., 2020; Risi et al., 2021). Additionally, there is a large body of research that supports a cumulative risk effect of ACEs on health outcomes; such that experiencing multiple adversity types compounds the level of difficulties (Felitti et al., 1998; Hales et al., 2023).

The majority of data in this area explores the impacts in school aged children and beyond, limiting our understanding of outcomes in adversity exposed young children (0-5 years). Considering the developmental link between adversity, attachment disorders, and emotional and behavioural wellbeing, it is important to examine these variables together in a sample of young children with documented social care experience.

Mental Health Difficulties and Attachment Disorders in Care Experienced Children

In care-experienced populations, there are high rates of both mental health problems and attachment disorder symptoms. In a meta-analysis of studies looking at pre-school children in foster care, Vasileva & Petermann (2018) found much higher rates of emotional and behavioural difficulties than would be expected in typical populations. Often these presentations can be chronic, with longitudinal studies demonstrating symptomatology persists over years despite removal from adverse environments (Barboza et al., 2017; Hiller & Clair, 2018). RAD and DSED symptoms are also heightened in care-experienced children. One longitudinal study recruiting 4- to 8-year-olds found that those in residential and adoptive placements had higher symptomatology of both attachment disorders than community controls, although symptoms in those who were adopted did decrease over time spent in stable placements (Román et al., 2022).

Another important factor implicated in care-experienced children's mental health and wellbeing is age at entry to care. In adolescent care-experienced groups, research shows that the older a child is when entering care, the poorer their social and mental health outcomes (Akister et al., 2010; Neil et al., 2019). It is thought that earlier placement mitigates exposure to adversity and offers opportunities to establish healthy relationships with new caregivers (Tarren-Sweeney, 2008). In younger children this pattern is less established, although

preliminary work shows a similar trend. In a small sample of 43 pre-school children in care, Hillen & Gafson (2014) showed that, entering care after 6 months of age was associated with more emotional, behavioural and attachment disorder symptoms than those placed in care earlier.

The Current Study and Aims

Overall, there is limited work that comprehensively characterizes the type and severity of adversity histories experienced by infants and young children prior to entry to care. This in turn limits our understanding of the impact of such histories on children's outcomes over time. The overall aim of the study was to explore the impact of ACEs and age at entry to care on attachment disorder symptoms and emotional and behavioural difficulties of young children in foster care over time. The following are the research questions that guided this work:

1) What are the characteristics of ACEs in a sample of young children in foster care, based on social care records?

2) To what extent are adversity and age at entry to care related to emotional, behavioural and attachment disorder symptoms?

3) To what extent do adversity and age at entry to care account for change in emotional, behavioural and attachment disorder symptoms over time?

Method

Participants and Procedure

This study utilises a secondary dataset of quantitative longitudinal data from a randomised controlled trial named the Best Services Trial (BeST?), conducted between 2011 and 2022 (Crawford et al., 2022). BeST? compares an infant mental health service intervention (using the New Orleans Intervention Model) with social work care-as-usual for pre-school children entering the foster care system. The trial aimed to establish what the best service is for young children entering foster care after adversity. BeST? recruited participants from Greater Glasgow and Clyde and several South London boroughs. Due to the availability of specific variables required for the current analysis (i.e., access to social care records for ACEs), participants from the London sites (n =110) were not included in the current study, leaving 378 participants from Glasgow.

All families with children under 5 years of age entering foster care in Greater Glasgow and Clyde since 2017 were offered to take part in the study, with a successful recruitment rate of around 60 percent and nearly 80 percent retained over 2.5 years (Minnis et al., 2024). Participant quantitative outcome measures were taken at 3 timepoints over the duration of the trial; Time 1 (T1) at a few weeks post entry to foster care, Time 2 (T2) at 15 months post accommodation, and Time 3 (T3) was around two and a half years later. For the current analysis, only data from Time 1 and 3 were used to explore longitudinal associations and changes over time (those are the two primary timepoints in the trial and the least disrupted by COVID-19 data collection difficulties). The only exclusion criteria for the overarching study were if biological parents were unable to engage in the trial due to death or long-term imprisonment. No further exclusions were applied in the current study.

Ethical approval was granted for the BeST? Trial by the West of Scotland Research Ethics Committee 3 (approval number 15/WS/0280; see appendix 2.4 for more information).

Informed written consent was sought from all carers involved in the study. Each participant received a unique anonymised identifier which linked their data throughout the trial, maintaining confidentiality. The use of anonymised data for the current analysis is covered within initial ethics approvals (Crawford et al., 2022) and the primary author was added to the research team involved with the processing of data (Appendix 2.5). The primary author was a Trainee Clinical Psychologist; they led on research question development, variable selection, data analysis and write up of the current study.

The current study included data from 378 participants (young children and their carers) recruited to BeST?. Of those, 193 received the New Orleans Intervention Model and 185 received social work care as usual. Table 1 presents demographic information.

Table *1* *Participant Characteristics*

Sex	Male %(n)		52.9 (200)	
	Female %(n)		47.1 (178)	
Scottish Index of Multiple Deprivation (SIMD)	Decile %(n)	1 (Most Deprived)	69.6 (261)	
		2	15.5 (58)	
		3	7.5 (28)	
		4	4.0 (15)	
		5	2.7 (10)	
		6	0.5 (2)	
		7	0.3 (1)	
		8	0.0 (0)	
		9	0.0 (0)	
		10 (Least Deprived)	0.0 (0)	
	n		Mean (SD)	Range
Age at T1 (Entry to Care) in Years	378		2.17 (1.71)	0.04 – 5.58

Measures

Age at Entry to Care

This is the age in months of child participants when they entered the trial (T1), and therefore the age they were when they entered foster care.

Deprivation Level

This was measured using the Scottish Index of Multiple Deprivation (SIMD; Scottish Government, 2020). This tool, created by Scottish Government, provides a single deprivation index score based upon postcode. It is derived from seven deprivation indicators including income, health, crime and housing provision. This data was based upon the biological family's postcode.

Adverse Childhood Experiences (ACE)

ACEs were coded using the Adverse Childhood Events Questionnaire (ACE-Q; Felitti et al., 1998). This is a 10-item questionnaire completed by the research team with the child's family, carers and records. Two raters independently coded this for each child, and then a consensus score per item was agreed upon. Each item requires a yes for present or no for absent response. The 10 types of ACEs included: Emotional Abuse, Physical Abuse, Sexual abuse, Emotional Neglect, Physical Neglect, Parental Separation, Domestic Violence, Substance Abuse, Household Member Mental Illness and Household Member Incarcerated. A cumulative ACEs score is calculated based on the sum of all 10 responses, with a possible range of scores from 0 to 10. Experiencing four or more ACEs is considered a 'high' level of ACEs related to significant levels of difficulty (Felitti et al., 1998; Hales et al., 2023).

Maltreatment Severity

Exposure to maltreatment was coded by research team members based upon children and families' social work records. Two raters independently coded this for each child, and then a consensus score was agreed upon. The system used was the Maltreatment

Classification System (MCS; Barnett, Manly & Cicchetti, 1993), with additional content added from the Modified Maltreatment Classification System (MMCS; English & the LONGSCAN Investigators, 1997). This system categorises maltreatment type; Physical Abuse, Sexual Abuse, Emotional Maltreatment, Physical Neglect – Failure to Provide, Physical Neglect – Lack of Supervision, Moral-Legal/Educational Maltreatment. The MCS allows for coding of severity of maltreatment. Total maltreatment severity was the primary outcome and was calculated using the method seen in Litrownik et al., (2005), whereby the ratings for the neglect and abuse maltreatment subtypes are summed. For total maltreatment severity, the maximum score is 54, with higher scores indicative of higher severity. This coding system is well used in maltreatment research (Huffhines et al., 2016).

Symptoms of Attachment Disorder

These were measured by The Disturbances of Attachment Interview (DAI; Smyke & Zeanah, 1999). This caregiver interview includes 12 items exploring clinical symptoms of Reactive Attachment Disorder (RAD) and Disinhibited Social Engagement Disorder (DSED). It has been shown to have strong reliability and validity (Lehmann et al., 2020). Each item was coded as 0 if symptoms were not present, 1 if there was moderate evidence of symptoms, and 2 if there was strong evidence. Scores are summed creating a symptom score for each disorder, with higher scores indicative of higher severity of Attachment Disorder symptoms. RAD symptoms are assessed by five questions and has a maximum score of ten. DSED symptoms are assessed by four questions with a maximum score of eight. Zeanah et al. (2002) recommends a cut-off of 3 or more indicating clinical levels of difficulty for each of the subscales.

Emotional and Behavioural Difficulties

The Strengths and Difficulties Questionnaire was used to measure emotional and behavioural difficulties (SDQ; Goodman, 2001). This short carer-report questionnaire

measures five domains: emotional symptoms, conduct problems, hyperactivity and inattention, peer relationship difficulties and prosocial behaviours. Items are scored on a three-point scale (0-2); not true, somewhat true and certainly true. Some items require reverse coding. Total difficulties score was the outcome variable used in this study and was calculated by summing the scores for all subscales, apart from prosocial behaviours. This is a screening measure, whereby higher scores are indicative of more difficulties. Goodman (2001) recommends a score of 17 or above potentially indicating clinical levels of difficulty. This measure is commonly used in research and clinical practice and has been demonstrated to have good validity and reliability in children aged 2 to 17 years of age (Goodman, 2001). As the SDQ is only validated in this age group, children younger than 2 years were not administered this measure and thus were not included in the analyses that used this outcome measure.

Analysis

Statistical analysis was carried out using R Studio (version 4.4.2; RStudio Team, 2020). Descriptive statistics were used to characterize types, rates and severity of ACEs in the sample, as well as deprivation levels and age at entry to foster care. Additional screening of the data was carried out to assess normality and linearity using histograms and scatterplots, respectively. Correlational analyses were conducted using bivariate Pearson correlations among variables across the two time points, to explore relationships between variables of interest.

Next, multiple regression was used to explore if ACE cumulative score and maltreatment severity predicted emotional, behavioural and attachment disorder symptoms at T3, above and beyond initial difficulties, whilst also controlling for age at entry to care and deprivation

levels. Two models, one for ACE cumulative score and another for maltreatment severity, were estimated for each of the outcomes (SDQ total emotional and behavioural difficulties, RAD symptoms, and DSED symptoms at T3). Other predictors in the model included symptom scores at T1, age at entry to care and SIMD decile. Treatment arm allocation (from the overarching study) was also controlled for.

Sample Size

A sample size analysis was completed based on previous effect sizes taken from research using the same dataset. With an effect size of 0.2 for an individual predictor in a multiple regression with 5 predictors, using a power of 0.9 and an alpha level of .05, it was estimated we would need a sample of 132 participants. As such, our sample was considered powered to conduct the analysis.

Results

Descriptives and Correlations

Characterisation of ACEs, Maltreatment Severity and Wellbeing Outcomes

The average age of entry to care in our sample was just over 2 years old (M=2.17, SD=1.71), however there was a range of ages, with some children entering care as newborns (Range = 0 - 5.6 years). The majority of children in the sample were living in the most deprived areas of Scotland, with 70 percent living in the first decile of the Scottish Index of Multiple Deprivation (Table 1 presents the breakdown of participants per decile, and other demographic information).

Around two thirds of the sample had experienced 4 or more ACEs prior to entering care, as assessed by the ACE-Q (M=4.49, SD = 2.87). Regarding abuse experiences, known exposure to sexual abuse was low in the sample (1.8%), whereas 17.6% of the sample were known to have been exposed to physical abuse, and almost half of the children in the study experienced emotional abuse (45.8%; See Table 2 for breakdown of rates of exposures). Around two thirds were known to have experienced emotional and/or physical neglect. Other ACEs were also high in this sample; a third of children had a member of their household in prison, and over half had a family member with significant mental illness and over 60% had a family member with substance abuse problems. Over 50% of children had been exposed to domestic violence. Maltreatment Severity for this sample of young children was at an average score of 10.41 (SD=7.32) out of a possible 54, and ranged from 0 to 36.

Table 2 *Adversity Experiences*

Adversity Variable	n	M (SD)	Range
MCS Maltreatment Total Severity (Abuse and Neglect)	332	10.41 (7.32)	0 – 36
MCS Abuse Severity	332	2.38 (2.15)	0 – 11
MCS Neglect Severity	332	8.03 (6.52)	0 – 31
ACE-Q Cumulative Score	330	4.49 (2.87)	0 – 9
Type of Adversity Experienced (using ACE-Q)			%
Emotional Abuse			45.8
Physical Abuse			17.6
Sexual abuse			1.8
Emotional Neglect			62.1
Physical Neglect			59.4
Parental Separation			59.4
Domestic Violence			53.9
Substance Abuse in the Home			61.5
Household Member Mental Illness			54.5
Household Member Incarcerated			33.3
Cumulative ACE Scores (using ACE-Q)			%
0			20.30
0-1 “Low”			22.73
2-3 “Medium”			8.79

4+ “High”	68.48

Table 3 *Symptom Outcome Measure Scores*

Outcome Measure	N	Mean (SD)	Range
SDQ Total Difficulties T1	155	12.53 (8.01)	0 – 37
SDQ Total Difficulties T3	286	11.61 (7.30)	0 – 31
DSED Symptoms T1	208	2.49 (2.28)	0 – 8
DSED Symptoms T3	205	1.37 (1.85)	0 – 8
RAD Symptoms T1	211	1.34 (1.62)	0 – 6
RAD Symptoms T3	205	0.69 (1.22)	0 - 9

Table 3 presents descriptive statistics for outcome measures of the study. All the above mean symptom scores for the sample fall under the respective cut-offs for clinical levels of difficulties, however, the range of scores was high.

Relationships between Symptom Variables

The correlations among variables are presented in Table 4. There was a small to moderate and significant relationship between SDQ total difficulties (SDQ) at T1 and T3 (r = 0.29, p = <.001). SDQ difficulties at T1 were also significantly related to both T1 and T3 RAD (moderate; r = 0.47, p = <.001 and small r = 31, p = <.01 respectively) and DSED scores (small; r = 0.35, p = <.01 and small; r = 0.30, p = <.01 respectively). For correlations between SDQ total difficulties at T3 and attachment symptoms, there was only significant correlations between RAD (moderate; r = 0.48, p = <.001) and DSED (moderate; r = 0.47, p = <.001) scores at T3, but not at T1.

Correlations between RAD and DSED scores at T1 had were moderate and significant (r = 0.52, *p* = <.001), as were RAD and DSED scores at T3. However, there was no significant correlation between either attachment disorder scores over time (between T1 and T3).

Relationships between adversity experiences and symptom scores

There were significant positive moderate/strong correlations between age at entry to care and cumulative/total ACE score (strong; r = 0.61, *p* = <.001) and maltreatment severity (moderate; r = 0.58, *p* = <.001). Age at entry to care was also significantly correlated with SDQ and DSED scores at T3, with small correlations (*ps* <.05), and did not have any other significant correlations with the remaining outcomes. Cumulative ACE score and maltreatment severity were significantly and strongly correlated with each other (strong; r = 0.69, *p* = <.001), but did not have any significant correlations with most outcomes. The one exception was that total ACE score was significantly associated with SDQ total difficulties at T3 (small; r = 0.22, *p* = <.001), and DSED symptom scores at T3 (small; r = 0.16, *p* = .03). Level of deprivation was not significantly correlated to any of the other variables in this analysis.

SDQ at T1 was significantly correlated with SDQ at T3 and with DSED and RAD scores at T1 and T3 (all *ps* <.05), whereas SDQ at T3 was not correlated with DSED and RAD scores at T1 (*ps* > .05). RAD did not show significant stability over time and RAD and DSED scores were only correlated with each other within timepoints but not over time.

Table 4 *Correlation Matrix*

Variable Name	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age at entry to foster care (T1)	1.00									
2. SIMD Decile	0.02	1.00								
3. Total ACE score	0.61*	0.02	1.00							
4. Maltreatment total severity	0.58*	-0.01	0.69*	1.00						
5. SDQ total difficulties T1	-0.01	-0.12	0.09	0.08	1.00					
6. SDQ total difficulties T3	0.12*	0.03	0.22*	0.11	0.29*	1.00				
7. DAI RAD score T1	0.04	-0.10	-0.10	0.00	0.47*	0.06	1.00			
8. DAI RAD score T3	0.12	-0.02	0.14	0.02	0.31*	0.48*	0.15	1.00		
9. DAI DSED score T1	-0.09	-0.11	0.04	0.00	0.35*	0.10	0.52*	0.17	1.00	
10. DAI DSED score T3	0.16*	0.04	0.16*	0.10	0.30*	0.47*	0.11	0.64*	0.27*	1.00

*p<.05

Multiple Regression Analysis

Tables 5, 6 and 7 include the results from the regression analyses used to explore predictors of symptoms at follow up (T3) for total emotional and behavioural difficulties, RAD and DSED symptoms, respectively. Predictors of interest were primarily ACE-Q cumulative total score, maltreatment severity, and age at entry to care, while controlling for outcome score at T1, deprivation, and treatment arm[2]. None of the models demonstrated issues with multicollinearity based on the variance inflation factors assessed.

Age at entry to care and severity of maltreatment score did not uniquely predict any of the outcomes at Time 3. Level of deprivation and treatment arm also were not significant covariates in any of the models. ACE score in the emotional and behavioural difficulties model, significantly predicted SDQ total difficulties score at Time 3, even when controlling for other predictors (Table 5; $\beta = 0.21$, $p = .03$). Total ACE scores did not predict attachment disorder symptoms over time.

[2] Models were run with an interaction effect between predictor and treatment arm assignment to investigate whether treatment arm moderated any of the results. However, none of the interaction terms were significant ($p > .05$), and therefore the analysis only retained treatment arm as a covariate in the model.

Table 5 Multiple Regression Analysis

Outcome: SDQ total difficulties at T3				
Model 1: ACE-Q	b	β	t	p
Age at T1 (age at entry to foster care)	-0.17	-0.02	-0.27	0.79
SIMD Decile	-0.30	-0.04	-0.48	0.63
Total ACE score	0.86	0.21*	2.27	0.03
SDQ total difficulties at T1	0.21	0.23*	2.49	0.01
Treatment Group	-1.43	-0.09	-1.06	0.29
Model 2: MCS Maltreatment Severity				
Age at T1 (age at entry to foster care)	-0.32	-0.05	-0.51	0.61
SIMD Decile	-0.12	-0.02	-0.18	0.86
Total Maltreatment Severity	0.19	0.15	1.56	0.12
SDQ total difficulties at T1	0.22	0.225**	2.65	<0.01
Treatment Group	-1.23	-0.08	-0.90	0.37

*p<.05
**p<.01

Table 6 Multiple Regression Analysis

Outcome: Symptoms of RAD at T3				
Model 1: ACE-Q	b	β	t	p
Age at T1 (age at entry to foster care)	-0.05	-0.05	-0.49	0.63
SIMD Decile	-0.09	-0.08	-0.87	0.39
Total ACE score	0.02	0.03	0.28	0.78
RAD at T1	0.08	0.11	1.14	0.26
Treatment Group	-0.03	-0.01	-0.15	0.88
Model 2: MCS Maltreatment Severity				
Age at V1 (age at entry to foster care)	-0.02	-0.02	-0.26	0.79
SIMD Decile	-0.09	-0.08	-0.86	0.39
Total Maltreatment Severity	-0.02	-0.11	-1.12	0.27
RAD at T1	0.07	0.10	1.06	0.29
Treatment Group	-0.04	-0.02	-0.19	0.85

*p<.05
**p<.01

Table 7 Multiple Regression Analysis

Outcome: Symptoms of DSED at T3				
Model 1: ACE-Q	b	β	t	p
Age at T1 (age at entry to foster care)	0.001	0.001	0.01	0.99
SIMD Decile	-0.03	-0.02	-0.16	0.87
Total ACE score	0.11	0.09	1.05	0.29
DSED at T1	0.17	0.22*	2.36	0.02
Treatment Group	0.04	0.01	0.11	0.91
Model 2: MCS Maltreatment Severity				
Age at T1 (age at entry to foster care)	0.009	0.006	0.07	0.95
SIMD Decile	-0.008	-0.005	-0.05	0.96
Total Maltreatment Severity	0.009	0.03	0.35	0.73
DSED at T1	0.16	0.22*	2.34	0.02
Treatment Group	0.05	0.01	0.15	0.88

*p<.05
**p<.01

Post Hoc Analysis

There were no significant predictors of attachment disorder symptomatology (RAD or DSED) at T3, based on the variables explored in this analysis, nor were attachment disorder symptoms showing strong stability over time (T1 symptoms did not strongly predict T3 symptoms). As such further exploratory, post hoc analysis was carried out to examine how these symptoms changed over time. Histograms for both RAD and DSED change scores were visualised with no concerns with normality noted. A Paired T-test was run to compare RAD and DSED symptomatology scores between T1 and T3. This demonstrated that both RAD and DSED symptomatology decreased over time, as scores were significantly lower at T3 than at T1 ($t = -3.85$, $p = <.001$ and $t = -3.72$, $p = <.001$ respectively). Effect size, as measured by Cohen's d, indicated a small effect for both total symptom scores (for RAD $d = -0.31$, and for DSED $d = -0.35$).

Discussion

This study explored emotional, behavioural and attachment disorder symptoms in a large sample of young children over a period of two and a half years in foster care, and their associations with age at entry to care and adversity histories. Strong associations between age at entry to care and history of adversity were found, suggesting that young children entering care at older ages were at risk of having experienced more ACEs and higher severity of maltreatment. In exploring changes in symptoms over time, it was found that cumulative adversity predicted an increase in emotional and behavioural difficulties, despite children having been in care for two and a half years. In addition, none of the predictors were associated with a change in attachment disorder symptoms, which were significantly lower

two and a half years into care as compared to initial levels, offering promising findings for young children in care.

Adversity Histories

This study was able to characterise the adversity history of a Scottish sample of very young children in foster care. Rates of known sexual and physical abuse in this sample were relatively low when compared to rates reported with older care-experienced children (Harris et al., 2024), and yet in line with previous research with young children in care (Palusci, 2011). Compared to general populations of children, care-experienced young children in this sample were disproportionately affected; research from the National Society for the Prevention of Cruelty to Children (NSPCC) in the UK reports rates of 0.1% and 1.3% for sexual and physical abuse, respectively, in their 'under 11 years old' nationally representative sample (Radford et al., 2011).

Rates of recorded emotional abuse and neglect in these young children were very high, with emotional neglect being the most experienced adversity in this sample, at 62%. These rates were similar to prevalences shown in whole childhood care-experienced samples and again, significantly disproportionate to non-care experienced populations (Radford et al., 2011; Harris et al., 2024). Wider adversities were also prevalent in the sample, with large proportions of the children having been exposed to domestic violence, and parental substance misuse, incarceration, and mental health difficulties. Overall, our characterisation of this sample shows the high levels of adversity experienced in care-experienced young children and despite their young age, they had experienced similar cumulative ACE totals as care-experienced older children in Scotland (Gibson, 2020). Around two thirds of participants had experienced four or more ACEs; a figure repeatedly found to be linked to significant psychological, social and physical health difficulties in later life (Hales et al., 2023). In this

respect, this young population requires multisectoral attention and intervention to prevent the occurrence of ACEs in the first instance and mitigate their negative sequelae when they do occur.

Effect of Adversity on Attachment Disorder, Emotional and Behavioural Symptoms

Longitudinal data allowed current analysis to explore the relationships between pre-care adversity and later mental health outcomes in young children, including emotional and behavioural difficulties and attachment disorder symptoms. The results show that cumulative ACEs score, based on exposure prior to entry to care, predicted an increase in emotional and behavioural difficulties over a 2.5 year period in care. That is, the more adversity types a child experienced before entering care, the higher their increased difficulties would be two and a half years later. These findings are consistent with the cumulative risk model and literature demonstrating the chronic and long-term impact of experiencing multiple types of adversity (Felitti et al., 1998; Hales et al., 2023). This finding is important to consider as it suggests that the removal into appropriate and supportive foster care placements, by itself, does not fully protect against the long-term impact of adversity on emotional and behavioural difficulties. This demonstrates that, while active intervention for the wellbeing of young children entering care is essential, targeted identification and prevention of early adversity in the first place remains paramount.

Notably, the same effect was not shown for maltreatment severity, despite there being a significant relationship between ACE total scores and maltreatment severity scores. There is large body of literature surrounding how to best conceptualise and measure trauma and adversity, and studies differ based on how adversity is operationalised such as by adversity type(s), accumulation of types, exposure frequency or severity (Grasso et al., 2019). It may

be that operationalising impact through severity is not as relevant in predicting later difficulties as cumulative total in this sample. Perhaps severity measurement introduces more subjective rater judgements that might not fully capture the experience of a young child, or that cumulative scoring more accurately represents the complexity of ACE co-occurrence. There could also be developmental differences in terms of when perceptions of severity are more strongly related to outcomes. These are some considerations that could be explored in future research looking at the complex dimensions of childhood adversity.

When exploring attachment disorder symptomatology, however, this study did not find any effects from cumulative ACE total or maltreatment severity on change in attachment disorder symptoms. This is surprising considering DSED and RAD are the only two disorders *specifically* linked to childhood maltreatment (American Psychiatric Association, 2013), and that previous literature, in older populations, have demonstrated associations between these factors (Moran et al., 2024). When exploring this further, it was found that symptoms of both attachment disorders did not show strong stability overtime, and there were reductions in both DSED and RAD over the 2.5 years in care. This is a clinically positive finding, demonstrating that for young children entering care after adversity, attachment disorder symptoms may improve when placed in appropriate care settings. This finding is in line with results from Roman and colleagues (2022), with children placed in adoptive families experiencing reductions in their RAD and DSED symptoms over time. This is likely due to children having opportunities to receive safe, consistent care from their caregivers, buffering the impact from their earlier experiences. Further research would be needed to explore the possible mediating effects of foster-care relationship quality and later attachment disorder symptoms. When taken in combination with our earlier finding, however, it is still important to highlight the stability in emotional and behavioural difficulties over time, and the increase in those

difficulties as a function of pre-care ACEs. Therefore, even though attachment disorder symptoms appear to reduce when children are removed from an unsafe environment, their emotional and behavioural needs may still require additional supports, including specialist mental health intervention.

Age at Entry to Care

The results of this study showed that while age at entry to care did not uniquely predict any changes in mental health outcomes at 2.5 years in care, it was significantly and strongly associated with pre-care cumulative ACE score and maltreatment severity. These results suggest that young children who were placed in care at an older age were exposed to more ACEs and more severe maltreatment prior to entry to care. This effect is notable considering the very young age of this sample and considering the impacts of ACEs on emotional and behavioural outcomes well into children's care experience. Even with relatively early social work intervention (under five years of age), these children were still vulnerable to experiencing extremely high levels of adversity. Again, this demonstrates the importance of early identification of risk and implementation of support for highly vulnerable families to ensure the future wellbeing of young children.

Our correlational analysis also demonstrated a small but significant relationship between age at entry to care and emotional and behavioural difficulties and DSED symptoms at T3. These findings are in line with previous, initial research in this area by Hillen and Gafson (2014), who published a cross-sectional study with a small sample of young children in London. They found a significant association between entering care after 6 months of age and having a mental health difficulty (including behavioural, emotional and/or attachment

disorders). Additionally, they found a significant relationship between exposure to multiple maltreatment types and mental health difficulties, similar to our findings.

Strengths, Limitations and Further research

This study was able to utilise a longitudinal dataset and characterize pre-care ACE and maltreatment histories of a relatively large sample of care-experienced young children, a typically underrepresented group. Additionally, the study overall had a high recruitment and retention rate (Minnis et al., 2024). Nonetheless, there are limitations of note. Firstly, the majority of participants lived within the lowest SIMD areas, and none lived in the three least deprived areas. There was perhaps not enough variation in the sample to see the impact of deprivation on outcomes, as the influence of this has been well established in previous literature (Visser et al., 2021). Second, the design of this study allowed for all eligible families in a large geographical area to be offered participation and had a recruitment rate of about 60 percent. However, it is not possible to know if the families that declined to take part were characteristically different, and therefore how representative or generalisable the results are. Third, an expected limitation of longitudinal designs is attrition, as shown by the missingness of variables across timepoints. Nonetheless, the numbers present offered a well powered study, and there were no significant differences between those who completed the trial and those who dropped out early (Minnis et al., 2024).

Additionally, the measure used to assess emotional and behavioural difficulties in this study was the SDQ (Goodman, 2001). While this measure is well used in the literature, it is only standardised in children aged two or above. Therefore, we were unable to characterise the emotional and behavioural difficulties of very young infants and factors that impact on this. Furthermore, there are other factors that could be important covariates that were not

measured or included in these analyses. This includes placement instability and the quality of relationships while in care. Finally, further longitudinal research would be helpful to assess if the established predictors have longer lasting effects beyond the 2.5 years explored in the current study.

Conclusion

Our findings demonstrate that, in a sample of young children in foster care, most had experienced a high number of ACEs including maltreatment and other types of adversity such as domestic violence and parental substance misuse. Those children were more likely to have been exposed to more ACEs and severe maltreatment the later in age they enter care. It was found that cumulative adversity predicted an increase in emotional and behavioural difficulties after 2.5 years in care, highlighting the need for further support and monitoring for this population. Regarding attachment disorders, average symptoms of RAD and DSED were lower at 2.5 years in care than initial levels and history of adversity did not impact changes over time. This may demonstrate that placing young children in supportive and safe environments can help reduce some of their symptoms, but that additional psychological supports may still be required for the emotional and behavioural wellbeing of those children. Importantly, the results speak to the continued need for early prevention of ACEs, and support for families to provide safe and stable environments for young children.

Statements and declarations

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Appendix 1.1 - PRISMA Checklist 2020

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	9
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	10
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	11-12
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	13
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	14
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	15
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	15, 81 – 86
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	15 – 16
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	16
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	16
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	16
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	16 – 17
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	17
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	17
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	17

Appendix 1.1 - PRISMA Checklist 2020

Section and Topic	Item #	Checklist item	Location where item is reported
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	17
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	17
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	17
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	17 – 18
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	29
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	29
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	19
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	n/a
Study characteristics	17	Cite each included study and present its characteristics.	20-24
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	26 – 27
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	29
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	28 – 29
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	28 – 29
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	29 – 30
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	29 - 30
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	28
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	29 - 30

Appendix 1.1 - PRISMA Checklist 2020

Section and Topic	Item #	Checklist item	Location where item is reported
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	30 – 22
	23b	Discuss any limitations of the evidence included in the review.	33
	23c	Discuss any limitations of the review processes used.	33
	23d	Discuss implications of the results for practice, policy, and future research.	30 – 33
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	12
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	12
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	n/a
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	33
Competing interests	26	Declare any competing interests of review authors.	33
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	87

Appendix 1.2 - Systematic Review Searches per Database

Source: PsycINFO
Interface: EBSCOhost
Database Coverage Dates: 1985 to Present
Search Date: 07/09/24
Search Strategy:

S1 TI (Child* Sexual* Abuse* OR Child* Sexual* Trauma OR Sexual* Abuse* OR CSA OR Molest* OR Child* Porn*) OR AB (Child* Sexual* Abuse* OR Child* Sexual* Trauma OR Sexual* Abuse* OR CSA OR Molest* OR Child* Porn*) 39507
S2 MA child sexual abuses 713
S3 S1 OR S2 41122
S4 TI (Post Traumatic Stress Disorder OR PTSD OR Post Traumatic Stress OR Post Traumatic Symptom* OR Post Traumatic Stress Symptom* OR Trauma Symptom* OR Psychopathology OR Emotional and Behavioural Problem*) OR AB (Post Traumatic Stress Disorder OR PTSD OR Post Traumatic Stress OR Post Traumatic Symptom* OR Post Traumatic Stress Symptom* OR Trauma Symptom* OR Psychopathology OR Emotional and Behavioural Problem*) 132880
S5 MA post traumatic stress disorder 68926
S6 S4 OR S5 132983
S7 TI (Victim Perpetrator n3 Relationship OR Child Perpetrator n3 Relationship OR Relationship n3 Perpetrator OR Relationship n3 Abuser OR Famil* n3 perpetrat* OR Caregiver n3 perpetrat* OR Perpetrator n3 Identity OR Incest* OR Extra familial OR Intra familial OR Trauma n3 characteristics OR Abuse n3 characteristics OR Crime n3 characteristics OR Trauma n3 features OR Abuse n3 features OR Crime n3 features) OR AB (Victim Perpetrator n3 Relationship OR Child Perpetrator n3 Relationship OR Relationship n3 Perpetrator OR Relationship n3 Abuser OR Famil* n3 perpetrat* OR Caregiver n3 perpetrat* OR Perpetrator n3 Identity OR Incest* OR Extra familial OR Intra familial OR Trauma n3 characteristics OR Abuse n3 characteristics OR Crime n3 characteristics OR Trauma n3 features OR Abuse n3 features OR Crime n3 features) 9955
S8 MA victim-perpetrator OR MA extrafamilial OR MA intrafamilial abuse 3393
S9 S7 OR S8 9989
S10 S3 AND S6 AND S9 453

Source: MEDLINE
Interface: EBSCOhost
Database Coverage Dates: 1966 to Present
Search Date: 07/09/24
Search Strategy:

S1 TI (Child* Sexual* Abuse* OR Child* Sexual* Trauma OR Sexual* Abuse* OR CSA OR Molest* OR Child* Porn*) OR AB (Child* Sexual* Abuse* OR Child* Sexual* Trauma OR Sexual* Abuse* OR CSA OR Molest* OR Child* Porn*) 51,748
S2 MH child abuse, sexual 11,339
S3 S1 OR S2 55,055
S4 TI (Post Traumatic Stress Disorder OR PTSD OR Post Traumatic Stress OR Post Traumatic Symptom* OR Post Traumatic Stress Symptom* OR Trauma Symptom* OR Psychopathology OR Emotional and Behavioural Problem*) OR AB (Post Traumatic Stress Disorder OR PTSD OR Post Traumatic Stress OR Post Traumatic Symptom* OR Post Traumatic Stress Symptom* OR Trauma Symptom* OR Psychopathology OR Emotional and Behavioural Problem*) 114,892
S5 MH post traumatic stress disorder 110,476
S6 S4 OR S5 118,835
S7 TI (Victim Perpetrator n3 Relationship OR Child Perpetrator n3 Relationship OR Relationship n3 Perpetrator OR Relationship n3 Abuser OR Famil* n3 perpetrat* OR Caregiver n3 perpetrat* OR Perpetrator n3 Identity OR Incest* OR Extra familial OR Intra familial OR Trauma n3 characteristics OR Abuse n3 characteristics OR Crime n3 characteristics OR Trauma n3 features OR Abuse n3 features OR Crime n3 features) OR AB (Victim Perpetrator n3 Relationship OR Child Perpetrator n3 Relationship OR Relationship n3 Perpetrator OR Relationship n3 Abuser OR Famil* n3 perpetrat* OR Caregiver n3 perpetrat* OR Perpetrator n3 Identity OR Incest* OR Extra familial OR Intra familial OR Trauma n3 characteristics OR Abuse n3 characteristics OR Crime n3 characteristics OR Trauma n3 features OR Abuse n3 features OR Crime n3 features)
8,345
S8 MH victim-perpetrator OR MH extrafamilial OR MH intrafamilial abuse
1,859
S9 S7 OR S8 10,200
S10 S3 AND S6 AND S9 231

Source: CINAHL
Interface: EBSCOhost
Database Coverage Dates: 1937 to Present
Search Date: 07/09/24
Search Strategy:

S1 TI (Child* Sexual* Abuse* OR Child* Sexual* Trauma OR Sexual* Abuse* OR CSA OR Molest* OR Child* Porn*) OR AB (Child* Sexual* Abuse* OR Child* Sexual* Trauma OR Sexual* Abuse* OR CSA OR Molest* OR Child* Porn*) 16504
S2 MH child abuse, sexual 7,408
S3 S1 OR S2 19,241
S4 TI (Post Traumatic Stress Disorder OR PTSD OR Post Traumatic Stress OR Post Traumatic Symptom* OR Post Traumatic Stress Symptom* OR Trauma Symptom* OR Psychopathology OR Emotional and Behavioural Problem*) OR AB (Post Traumatic Stress Disorder OR PTSD OR Post Traumatic Stress OR Post Traumatic Symptom* OR Post Traumatic Stress Symptom* OR Trauma Symptom* OR Psychopathology OR Emotional and Behavioural Problem*) 43,435
S5 MH post traumatic stress disorder 718
S6 S4 OR S5 43,637
S7 TI (Victim Perpetrator n3 Relationship OR Child Perpetrator n3 Relationship OR Relationship n3 Perpetrator OR Relationship n3 Abuser OR Famil* n3 perpetrat* OR Caregiver n3 perpetrat* OR Perpetrator n3 Identity OR Incest* OR Extra familial OR Intra familial OR Trauma n3 characteristics OR Abuse n3 characteristics OR Crime n3 characteristics OR Trauma n3 features OR Abuse n3 features OR Crime n3 features) OR AB (Victim Perpetrator n3 Relationship OR Child Perpetrator n3 Relationship OR Relationship n3 Perpetrator OR Relationship n3 Abuser OR Famil* n3 perpetrat* OR Caregiver n3 perpetrat* OR Perpetrator n3 Identity OR Incest* OR Extra familial OR Intra familial OR Trauma n3 characteristics OR Abuse n3 characteristics OR Crime n3 characteristics OR Trauma n3 features OR Abuse n3 features OR Crime n3 features)
2,796
S8 MH victim-perpetrator OR MH extrafamilial OR MH intrafamilial abuse 902
S9 S7 OR S8 2,887
S10 S3 AND S6 AND S9 89

Source: ASSIA
Interface: ProQuest
Database Coverage Dates: 1987 to Present
Search Date: 07/09/24
Search Strategy:

(mainsubject.Exact("child abuse, sexual" OR "child sexual abuse") OR title(Child* Sex* Abuse* OR Child* Sex* Trauma OR Sex* Abuse* OR CSA OR Molest* OR Child* Porn*) OR abstract(Child* Sex* Abuse* OR Child* Sex* Trauma OR Sex* Abuse* OR CSA OR Molest* OR Child* Porn*)) AND (mainsubject.Exact("post traumatic stress disorder") OR title(Post Traumatic Stress Disorder OR PTSD OR Post Traumatic Stress OR Post Traumatic Symptom* OR Post Traumatic Stress Symptom* OR Trauma Symptom* OR Psychopathology OR Emotional Behavioural Problem*) OR abstract(Post Traumatic Stress Disorder OR PTSD OR Post Traumatic Stress OR Post Traumatic Symptom* OR Post Traumatic Stress Symptom* OR Trauma Symptom* OR Psychopathology OR Emotional Behavioural Problem*)) AND (title((Victim Perpetrator NEAR/3 Relation*) OR (Child Perpetrator NEAR/3 Relation*) OR (Relation* NEAR/3 Perpetrator) OR (Relation* NEAR/3 Abuser) OR (Famil* NEAR/3 perpetrat*) OR (Caregiver NEAR/3 perpetrat*) OR (Perpetrator NEAR/3 Identity) OR Incest* OR Extra familial OR Intra familial OR (Trauma NEAR/3 characteristics) OR (Abuse NEAR/3 characteristics) OR (Crime NEAR/3 characteristics) OR (Trauma NEAR/3 features) OR (Abuse NEAR/3 features) OR (Crime NEAR/3 features)) OR abstract((Victim Perpetrator NEAR/3 Relation*) OR (Child Perpetrator NEAR/3 Relation*) OR (Relation* NEAR/3 Perpetrator) OR (Relation* NEAR/3 Abuser) OR (Famil* NEAR/3 perpetrat*) OR (Caregiver NEAR/3 perpetrat*) OR (Perpetrator NEAR/3 Identity) OR Incest* OR Extra familial OR Intra familial OR (Trauma NEAR/3 characteristics) OR (Abuse NEAR/3 characteristics) OR (Crime NEAR/3 characteristics) OR (Trauma NEAR/3 features) OR (Abuse NEAR/3 features) OR (Crime NEAR/3 features))) 120

Source: EMBASE
Interface: OVID
Database Coverage Dates: 1947 to Present
Search Date: 07/09/24
Search Strategy:

1. (Child* Sex* Abuse* or Child* Sex* Trauma or Sex* Abuse* or CSA or Molest* or Child* Porn*).ab,kf,ti.
2. child sexual abuse.mp.
3. 1 or 2
4. (Post Traumatic Stress Disorder or PTSD or Post Traumatic Stress or Post Traumatic Symptom* or Post Traumatic Stress Symptom* or Trauma Symptom* or Psychopathology or Emotional Behavioural Problem*).ab,kf,ti.
5. Post Traumatic Stress Disorder.mp.
6. 4 or 5
7. ((Victim Perpetrator adj4 Relation*) or (Child Perpetrator adj4 Relation*) or (Relation* adj4 Perpetrator) or (Relation* adj4 Abuser) or (Famil* adj4 perpetrat*) or (Caregiver adj4 perpetrat*) or (Perpetrator adj4 Identity) or Incest* or "Extra familial" or "Intra familial" or (Trauma adj4 characteristics) or (Abuse adj4 characteristics) or (Crime adj4 characteristics) or (Trauma adj4 features) or (Abuse adj4 features) or (Crime adj4 features)).ab,kf,ti.
8. victim-perpetrator.mp.
9. extra familial.mp.
10. intra familial.mp.
11. 7 or 8 or 9 or 10
12. 3 and 6 and 11 223

Source: Web of Science Core Collection
Interface: Clarivate
Database Coverage Dates: 1900 to Present
Search Date: 07/09/24
Search Strategy:

1: (TI=(Child* Sex* Abuse* OR Child* Sex* Trauma OR Sex* Abuse* OR CSA OR Molest* OR Child* Porn*))OR(AB=(Child* Sex* Abuse* OR Child* Sex* Trauma OR Sex* Abuse* OR CSA OR Molest* OR Child* Porn*))OR(AK = child sexual abuse) and Preprint Citation Index (Exclude – Database) 136368

2: (TI=(Post Traumatic Stress Disorder OR PTSD OR Post Traumatic Stress OR Post Traumatic Symptom* OR Post Traumatic Stress Symptom* OR Trauma Symptom* OR Psychopathology OR Emotional Behavioural Problem*))OR(AB=(Post Traumatic Stress Disorder OR PTSD OR Post Traumatic Stress OR Post Traumatic Symptom* OR Post Traumatic Stress Symptom* OR Trauma Symptom* OR Psychopathology OR Emotional Behavioural Problem*))OR(AK= (Post Traumatic Stress Disorder OR PTSD)) and Preprint Citation Index (Exclude – Database) 213938

3: ((TI=((Victim Perpetrator NEAR/3 Relation*) OR (Child Perpetrator NEAR/3 Relation*) OR (Relation* NEAR/3 Perpetrator) OR (Relation* NEAR/3 abused) OR (Famil* NEAR/3 perpetrat*) OR (Caregiver NEAR/3 perpetrat*) OR (Perpetrator NEAR/3 Identity) OR Incest* OR Extra familial OR Intra familial OR (Trauma NEAR/3 characteristics) OR (Abuse NEAR/3 characteristics) OR (Crime NEAR/3 characteristics) OR (Trauma NEAR/3 features) OR (Abuse NEAR/3 features) OR (Crime NEAR/3 features)))OR(AB =((Victim Perpetrator NEAR/3 Relation*) OR (Child Perpetrator NEAR/3 Relation*) OR (Relation* NEAR/3 Perpetrator) OR (Relation* NEAR/3 abused) OR (Famil* NEAR/3 perpetrat*) OR (Caregiver NEAR/3 perpetrat*) OR (Perpetrator NEAR/3 Identity) OR Incest* OR Extra familial OR Intra familial OR (Trauma NEAR/3 characteristics) OR (Abuse NEAR/3 characteristics) OR (Crime NEAR/3 characteristics) OR (Trauma NEAR/3 features) OR (Abuse NEAR/3 features) OR (Crime NEAR/3 features))OR(AK= (victim-perpetrator OR extra familial OR intra familial)))) NOT (SILOID==("PPRN")) 21071

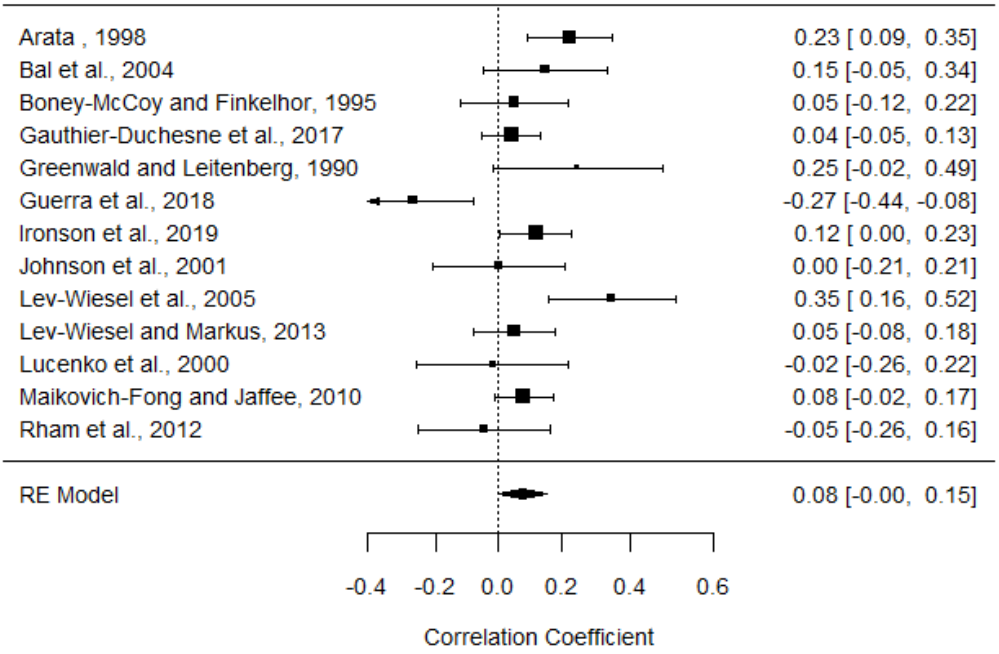
4: #1 AND #2 AND #3 and Preprint Citation Index (Exclude – Database) 511

5: #1 AND #2 AND #3 and Preprint Citation Index (Exclude – Database) and Web of Science Core Collection (Database)

Appendix 1.3 - Systematic Review Code for Meta-analysis

RStudio Code used for analysis can be found at: https://osf.io/6fsvr

Appendix 1.4 - Initial Meta-analysis Forest Plot prior to removal of influential study



Appendix 2.1 – STROBE Checklist

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No.	Recommendation	Page No.
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	42
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	45
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	46-49
Objectives	3	State specific objectives, including any prespecified hypotheses	49
Methods			
Study design	4	Present key elements of study design early in the paper	49
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	50
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	50
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	51 – 54

Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	51 – 54
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	51 – 54
Bias	9	Describe any efforts to address potential sources of bias	51 – 54
Study size	10	Explain how the study size was arrived at	55

Continued on next page

Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	54
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	54
		(*b*) Describe any methods used to examine subgroups and interactions	54
		(*c*) Explain how missing data were addressed	57
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	57
		(*e*) Describe any sensitivity analyses	58
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	57
		(b) Give reasons for non-participation at each stage	57
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	51
		(b) Indicate number of participants with missing data for each variable of interest	57
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	50
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	50
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	n/a
		Cross-sectional study—Report numbers of outcome events or summary measures	n/a
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	61 – 63
		(*b*) Report category boundaries when continuous variables were categorized	51

	(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a

Continued on next page

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	64 - 65
Key results	18	Summarise key results with reference to study objectives	65
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	65 – 70
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	65 – 70
Generalisability	21	Discuss the generalisability (external validity) of the study results	65 – 70
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	71

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Appendix 2.2 – Original Approved MRP Proposal

Please find via this link: https://osf.io/mx8fe

Please note that the study described in this proposal was not completed due to circumstances outside of the researcher's control. For the proposal of the project presented in this thesis, please see Appendix 2.3.

Appendix 2.3 – Current MRP Proposal

Please find this via this link: https://osf.io/knrze

This proposal/MRP was approved by my supervisor and research advisor.

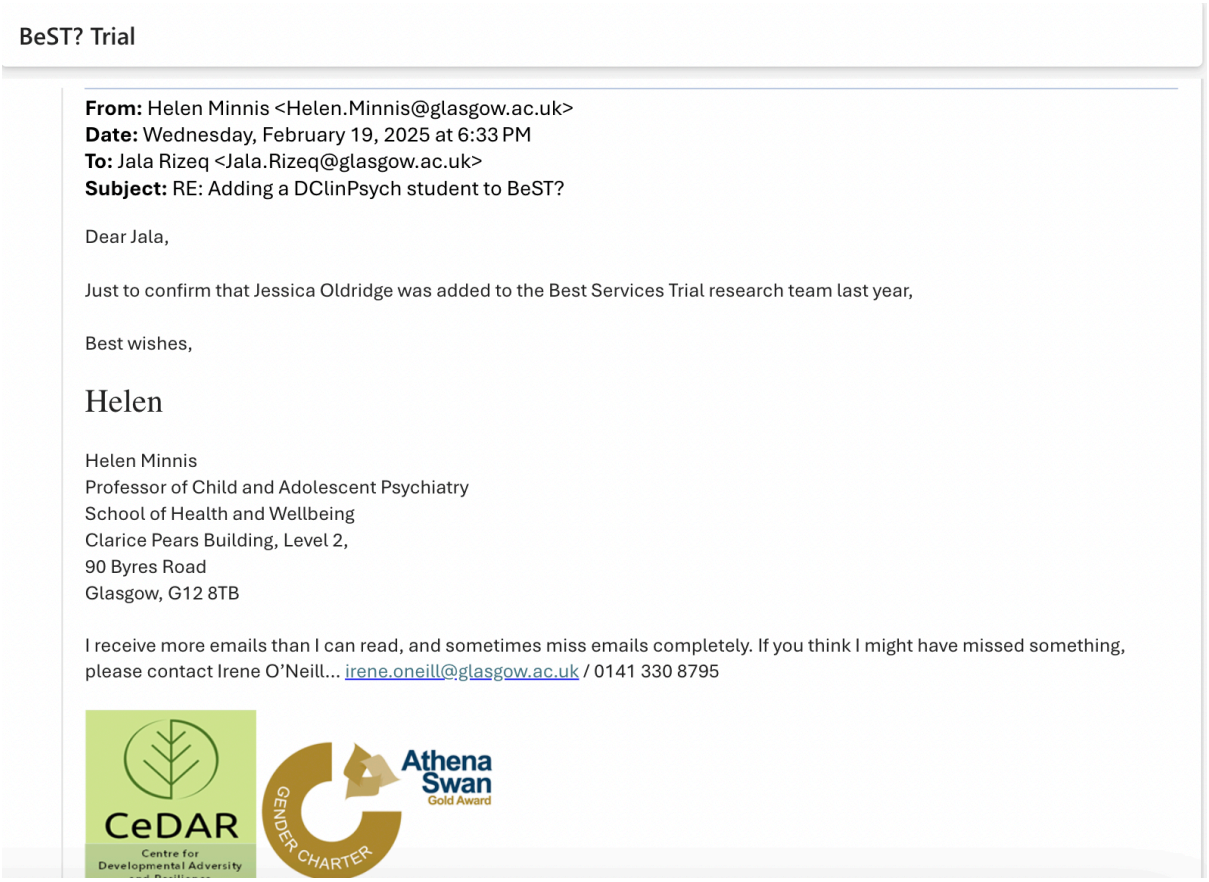
Appendix 2.4 – MRP Ethical Approval

For the BeST^2 Trial ethical approval information, please see this webpage:

https://www.hra.nhs.uk/planning-and-improving-research/application-summaries/research-summaries/best/

Appendix 2.5 – Approval for Researcher

Below is an e-mail from Professor Helen Minnis (Chief Investigator of BeST?) confirming the author as a member of the BeST? trial team.



BeST? Trial

From: Helen Minnis <Helen.Minnis@glasgow.ac.uk>
Date: Wednesday, February 19, 2025 at 6:33 PM
To: Jala Rizeq <Jala.Rizeq@glasgow.ac.uk>
Subject: RE: Adding a DClinPsych student to BeST?

Dear Jala,

Just to confirm that Jessica Oldridge was added to the Best Services Trial research team last year,

Best wishes,

Helen

Helen Minnis
Professor of Child and Adolescent Psychiatry
School of Health and Wellbeing
Clarice Pears Building, Level 2,
90 Byres Road
Glasgow, G12 8TB

I receive more emails than I can read, and sometimes miss emails completely. If you think I might have missed something, please contact Irene O'Neill... irene.oneill@glasgow.ac.uk / 0141 330 8795

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Gold Award

Appendix 2.6 – Data Analysis Plan

For a copy of MRP data analysis plan, please see: https://osf.io/azk5q

Appendix 2.7 – Major Research Project analysis code for RStudio

Please find RStudio code used for data analysis, with explanatory comments, at:

https://osf.io/ke8q9

Appendix 2.8 – Data Availability Statement

Data sharing is not applicable to this study, as no novel data was generated by the author (secondary data analysis). Any requests should be discussed with the BeST$^{?}$ team.

Appendix 2.9 - Interaction Model between Treatment Arm and Adversity Measure, per Symptom Outcome

SDQ Total Difficulties	*p*
Total Maltreatment Severity:Treatment Arm interaction	.39^{ns}
Total ACE score:Treatment Arm interaction	.35^{ns}
RAD Symptoms	
Total Maltreatment Severity:Treatment Arm interaction	.90^{ns}
Total ACE score:Treatment Arm interaction	.26^{ns}
DSED Symptoms	
Total Maltreatment Severity:Treatment Arm interaction	.34^{ns}
Total ACE score:Treatment Arm interaction	.69^{ns}