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Attachment Disorders and Neurodivergence in Adoptees: The Importance of Holistic Perspectives in the Context of Maltreatment Histories

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Chapter 1

Reactive Attachment Disorder, Disinhibited Social Engagement Disorder and Neurodivergence in Adolescent and Adult Adoptees: A Systematic Review of Prevalence, Co-occurrence and Impact

Prepared in accordance with the author requirements for Clinical Psychology and Psychiatry*:
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*To demonstrate the required research competencies for this Doctoral thesis the maximum word limit for the target journal has been exceeded, the word count will be adhered to for publication.

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Abstract

Background. Reactive attachment disorder (RAD), disinhibited social engagement disorder (DSED) and neurodevelopmental differences are associated with childhood maltreatment. Current research trends focus on young children and the unique perspectives of adoptees experiences are limited. This systematic review aimed to explore prevalence, co-occurrence, and functional impact of RAD, DSED and neurodevelopmental differences in adopted adolescents and adults.

Methods. EMBASE, MEDLINE, PsycINFO, CINAHL, Child Development and Adolescent Studies, Psychology and Behavioural Sciences Collection, ASSIA, the Web of Science Core Collection, and ProQuest Dissertations and Theses were searched on 4th December 2025. Study quality was assessed using the Joanna Briggs Institute checklists for cohort and prevalence studies. Results were narratively synthesised.

Results. Seven studies (1995–2022) met inclusion criteria. ADHD was the most consistently reported outcome across adolescents and young adults, DSED was reported in one study for young adults. Prevalence of autism and learning disabilities in adolescents, reported in one study each, were comparable to population rates. No studies reported RAD, developmental language disorder, developmental coordination disorder, tic disorders, or Tourette syndrome. Categorical co-occurrence was not reported. Functional impacts across presentations included behavioural difficulties, educational challenges, and reduced parental adoption satisfaction. Methodological quality of included studies was limited by small samples, caregiver-reported outcomes, and focus on extreme deprivation.

Conclusions. Findings highlight gaps in understanding RAD, DSED and neurodevelopmental differences in adopted adolescents and adults. This gap underscores the need for longitudinal, multi-informant research to inform clinical practice and support.

Keywords: *adoptees; RAD; DSED; attachment disorders; maltreatment; neurodevelopmental disorders; neurodevelopmental conditions*

Introduction

Experiences of severe abuse and neglect in early life, which commonly precede adoption, are often termed childhood maltreatment (CM; Fisher, 2015; Ligier et al., 2022). CM is a known risk factor for reactive attachment disorder (RAD) and disinhibited social engagement disorder (DSED), commonly referred to in clinical practice as attachment disorders (American Psychiatric Association [APA], 2013; World Health Organisation [WHO], 2022). Furthermore, there is increasing recognition that neurodevelopmental disorders (herein referred to as differences to align with neuro-affirming practice), including attention-deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (hereafter referred to as autism), often occur in the context of CM (Gajwani & Minnis, 2023; Zarei et al., 2021). These presentations typically emerge during the developmental period and often present with overlapping symptom profiles across social, emotional and cognitive functioning. This, combined with the unique characteristics of adopted populations, poses challenges in identifying RAD, DSED and neurodivergence across the life course for adoptees, with implications for assessment, formulation, and access to appropriate support (National Institute for Health and Care Excellence [NICE], 2015).

Attachment Disorders – Potential Outcomes of CM

RAD and DSED are the only two psychiatric presentations of childhood which are causally associated with CM. Exposure to severe neglect or insufficient caregiving is a required diagnostic feature (APA, 2013; WHO, 2011). Both disorders reflect patterns of attachment behaviours and significant social relationship difficulties that develop in response to profound disruptions in the early caregiving environment. RAD is characterised by significantly reduced comfort-seeking and significantly reduced

acceptance of comfort from primary caregivers when distressed (APA, 2013). Inhibited, emotionally withdrawn, fearful and/or irritable behaviour toward caregivers may also be associated (Seim et al., 2022). DSED, once conceptualised as a subtype of RAD termed 'disinhibited-RAD' (APA, 2000), is now recognised as a distinct presentation marked by indiscriminate sociability and reduced reticence with unfamiliar adults (APA, 2013), irrespective of attachment status (Guyon-Harris et al., 2019; Pears et al., 2010).

Neurodivergence – Co-Occurrence in the Context of CM

There is now a robust body of literature which recognises the co-occurrence of CM and neurodevelopmental differences such as ADHD and autism (Zarei et al., 2021; Dinkler, 2017). Common features across neurodevelopmental differences include, challenges with attention, communication, social reciprocity, adaptive functioning, motor skills and emotion regulation (APA, 2013). On the surface, many of these features appear similar to those seen in RAD and DSED. Yet, unlike RAD and DSED, neurodevelopmental differences are known to arise from genetic and biological factors, rather than being caused by environmental experiences such as CM (Dinkler et al., 2017; Gillberg, 2010). In fact, children with neurodivergent profiles are recognised as being at increased risk of experiencing maltreatment (Bali et al., 2023; McDonnell et al., 2019).

Emerging evidence suggests that co-occurrence of attachment-related and neurodevelopmental differences is likely the norm, rather than the exception, in the context of CM (Minnis, 2013). Dinkler et al. (2017), in a large population-based twin study, found that children exposed to maltreatment demonstrated approximately tenfold increased odds of presenting with at least one neurodevelopmental

difference, particularly ADHD and autism, compared with non-maltreated peers. Speech, language and communication difficulties are common among care-experienced young people (Maguire et al., 2021) and in adulthood, experiences of severe and prolonged CM have been associated with autistic-like traits and lower cognitive functioning (Rodriguez-Perez et al., 2023; Sonuga-Barke et al., 2017).

Implications of Complexity

It has been hypothesised that co-occurrence of attachment disorders (RAD and/or DSED) and neurodevelopmental differences in maltreated young people may confer a "double jeopardy" (Gajwani & Minnis, 2023, pp.1), which, without holistic consideration of both, may lead to increased risk of poorer mental health outcomes. Understanding the distinct aetiologies, overlapping symptomologies and the interconnected developmental pathways (Bali et al., 2023; Jangid et al., 2025) is therefore clinically important for the differentiation and identification of specific needs that inform appropriate and targeted intervention (Hiller et al., 2023).

In most cases of RAD, for example, symptom reduction in younger children is commonly reported following nurturing care and secure attachment; although some cases persist into later development for reasons that remain unclear (Turner et al., 2022). Conversely, DSED has been shown to persist even when secure attachments have been formed (Zeanah et al., 2002), with persistence into adolescence and adulthood now recognised (Guyon-Harris et al., 2018; Kennedy et al., 2017; Seim et al., 2022; Sonuga-Barke et al., 2017). Preliminary evidence suggests that psychoeducation and targeted social relationship work may be more supportive for DSED (Zilberstein, 2023) than focusing only on the attachment relationship. In contrast, neurodevelopmental differences are typically best supported through

environmental and communication adaptations (McCool, 2023; Zilberstein, 2023). Moreover, inappropriate recognition and understanding in populations presenting with CM histories and neurodivergence may mean specific needs are left unsupported and may contribute to increased risk of negative life outcomes. For example, increased experiences of severe psychiatric presentations including mania and substance use disorders in adolescents (Gajwani et al., 2021; Moran et al., 2024), and poorer employment outcomes and even increased risk of suicide in adulthood (Ligier et al., 2022; Sonuga-Barke et al., 2017) are reported in the literature.

Existing Review Literature

The long-term impact of early life trauma on cognitive and emotional development is well recognised; however, existing literature reflects substantial heterogeneity in how trauma is defined and measured, alongside variability in the assessment of neurodevelopmental and psychopathological outcomes, limiting the generalisability of findings (Fan & Kang, 2025; Jangid et al., 2025). Review evidence (Heady et al., 2023) has demonstrated elevated rates of neurodevelopmental and cognitive difficulties, including ADHD, autism, and cognitive impairment in care-experienced populations. However, adoptees were excluded from this review despite representing a distinct developmental group. This omission is notable given the significant number of children adopted each year globally and the adverse life outcomes this population may experience (Ligier et al., 2022).

Adoptees experience a unique developmental trajectory characterised by transition from early adversity to new, typically permanent, caregiving environments, which may simultaneously reduce vulnerability and increase identification of neurodevelopmental and maltreatment-associated difficulties (Fisher, 2015). Prior to

adoption, some adoptees may have spent much of their early years, including critical periods of development, in institutional environments. Within the literature, such environments typically refer to Eastern European orphanages, such as those included in the English-Romanian Adoption Studies (Rutter et al., 2010). Institutionalised care is characterised by severe deprivation where the number of children placed in institutions depletes the care availability of attuned caregiving. Prolonged exposure to the maltreatment environment has been positively associated with the severity of RAD and DSED (Julian, 2013; Sonuga-Barke et al., 2017). However, community samples of maltreated children also demonstrate elevated rates of RAD and DSED, and in many cases, co-occurring neurodivergence, compared to non-maltreated samples (Kay et al., 2016; Moran et al., 2024; Pears et al., 2010; Seim et al., 2022) demonstrating that these presentations are not isolated to institutionalised care. The diversity of adoptees experiences therefore underscores a need to consider them as a unique population.

Existing adoption-focused reviews suggest elevated neurodevelopmental and mental health risk across development but highlight important gaps. Elevated rates of autism and autistic traits have been reported in younger children (Green et al., 2016), while meta-analytic evidence indicates increased ADHD risk and prevalence in adopted adolescents and early adolescents (Askeland et al., 2017; Behle & Pinquart, 2016). Longitudinal synthesis suggests ADHD differences may persist across the lifespan, whereas cognitive functioning and IQ outcomes appear broadly comparable to population norms, though they remain influenced by pre-adoption adversity and post-adoption environment (Zournatzidis et al., 2025). In adult adoptees, review evidence suggests increased risk of ADHD, poorer mental health outcomes and

challenges with psychological adjustment, but authors note that research in this area remains limited (Melero & Sánchez-Sandoval, 2017; Sánchez-Sandoval et al., 2020).

Evidence increasingly recognises overlap between maltreatment experiences and neurodevelopmental differences, with shared behavioural, cognitive, and social presentations complicating diagnostic differentiation (Gajwani & Minnis, 2023; Zarei et al., 2021). Within this context, attachment disorders, i.e., RAD and DSED, represent core psychopathological outcomes for maltreated populations yet reporting of RAD and DSED within adoption research remains limited and inconsistently operationalised (Davidson et al., 2015; 2024). This gap is notable given that adoptees frequently experience early maltreatment, institutionalisation, or caregiving disruption prior to placement. Adoptees therefore represent a population in which attachment disorders and neurodevelopmental presentations may co-exist or present with overlapping symptom profiles.

The current evidence base pertaining to adoptees is also limited due to reviews having tended to consider mental health outcomes broadly, often prioritising behavioural and emotional difficulties, with limited examination of diagnostic prevalence, co-occurrence, or functional impact across specific developmental conditions. Furthermore, adolescence and adulthood are rarely synthesised as distinct developmental periods in adoption research. This may obscure understanding of how maltreatment-related and neurodevelopmental presentations evolve as adoptees navigate increasingly complex social, emotional, and occupational demands across the lifespan. Improving understanding of these trajectories is important to support accurate diagnostic formulation and appropriate service provision for adopted individuals.

Current Review

To address this gap, the current study aimed to systematically review the literature pertaining to the prevalence, co-occurrence, and impact on functioning of RAD, DSED and neurodivergence in adopted adolescents and adults. The research questions were:

1. What is the prevalence of RAD, DSED and neurodivergence (i.e., autism, ADHD, learning disability [LD], developmental co-ordination disorder [DCD], developmental language disorder [DLD], tic disorders and Tourette's syndrome) reported among adopted adolescents and adults in the literature?
2. To what extent is co-occurrence with RAD, DSED and neurodivergence reported in adopted adolescents and adults?
3. What are the impacts of RAD, DSED and neurodivergence as reported in the literature for adopted adolescents and adults?
4. What are the methodological issues or challenges with the evidence base pertaining to identifying and understanding RAD, DSED and neurodivergence in adopted adolescents and adults?

Methods

The review was registered with the International Prospective Register of Systematic Reviews (PROSPERO; registration number: CRD420251089287), and the review protocol is available here also. The review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Page et al., 2020); the reporting checklist is available in Appendix A.

Eligibility Criteria

Eligible study designs included any study reporting quantitative prevalence data. International studies were included, with no restrictions on publication date. Studies using earlier terminology for RAD, DSED, and neurodevelopmental differences were also eligible, as the core features of these presentations have remained consistent despite reclassifications. Eligibility criteria were informed by the CoCoPop framework to identify the condition, context and populations of interest (Hosseini et al., 2024).

Inclusion criteria:

- Exclusively sampled adopted and/or previously institutionalised individuals who were subsequently adopted (i.e., institutionalisation represents a pre-adoptive experience), or if this population was partially sampled and the data was reported separately from a wider cohort.
- Participants were aged ≥15 years, either as a defined age range or where the mean sample age met this threshold.
- Reported prevalence data or estimates for at least one clinical diagnosis of interest.
- Clinical diagnoses aligned with contemporaneous diagnostic criteria or clinically recognised and validated assessment tools.

Exclusion criteria:

- Reviews, editorials, book chapters or single case studies.
- Reported qualitative data only.
- Included adoptees within broader cohorts without disaggregated data.
- Focused exclusively on foster care or long-term foster populations.

- Focused on conditions with a known genetic or substance-related aetiology (e.g. foetal alcohol spectrum disorder or Fragile X syndrome).
- Reported attachment patterns with no clear diagnostic reporting of RAD or DSED.
- Employed genetically focused research methods.

Search Strategy

The search strategy (Appendix B) was developed in consultation with a librarian and used database-specific subject headings, keywords, Boolean operators and truncation. Searches were limited to English-language studies. Peer-reviewed literature was searched in EMBASE, MEDLINE, PsycINFO, CINAHL, Child Development and Adolescent Studies, Psychology and Behavioural Sciences Collection, ASSIA, and the Web of Science Core Collection. To reduce publication bias, grey literature was searched via ProQuest Dissertations and Theses (Paez, 2017). Searches were conducted on 4th December 2025. Forward and backward citation searching of included studies, as well as targeted Google Scholar searches, were also conducted to identify additional studies.

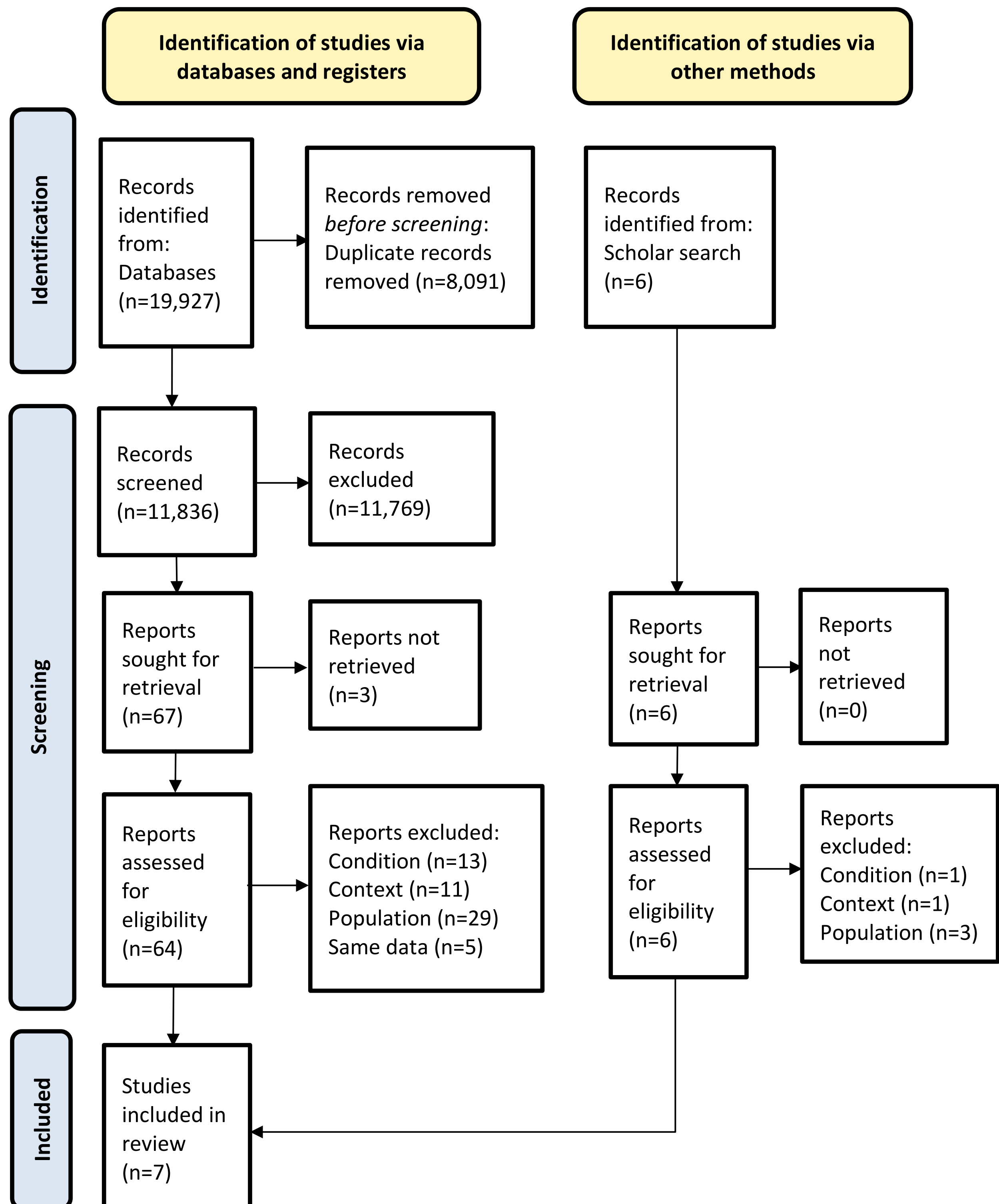
Screening

Reference management software (EndNote) and the systematic review platform Rayyan were used to facilitate screening. To enhance reliability and reduce selection bias, two reviewers were involved in study screening, data extraction and quality appraisal, with discrepancies resolved through discussion and consensus (Stoll et al., 2019). Duplicates were removed and titles, abstracts and then full texts were sequentially screened against eligibility criteria. A second screener (LC) independently

screened 20% of records at both stages, with no discrepancies observed. The selection process, including reasons for exclusion of full texts, is presented in Figure 1.

Figure 1

PRISMA flowchart of study of selection process (Page et al. 2025)



Data Extraction

A template developed by the main researcher was used to extract data from the final included studies by the main researcher, with 20% also independently reviewed by a second screener. Extracted variables were related to study information, sample characteristics (including adoption characteristics) and outcome data (presentation, prevalence, measurement, co-occurrence, impacts). Data extraction was conducted prior to quality analysis to reduce bias by blinding researchers to study quality (Boland et al., 2017). All data extracted and analysed during this review are available within the article and appendices. The primary data used for the current synthesis were extracted from previously published studies, all of which are cited in the reference list. No new datasets were generated during the current review.

Quality Appraisal

Included studies were rated by main researcher, and 20% independently by second screener, for methodological bias using the Joanna Briggs Institute (JBI) checklists. The JBI checklists were chosen to allow for different included study designs to be appraised. Cohort checklists were used for studies examining adoption-related exposures and developmental outcomes, while prevalence checklists were applied to studies reporting prevalence estimates. The JBI tools rate items as 'yes', 'no', 'unclear', or 'not applicable'. Domain-level evaluations and narratives were examined to review patterns of methodological strengths and limitations, rather than overall scores, which can give a false sense of precision (Barker et al., 2023; Page et al., 2020).

Synthesis Method

Findings were synthesised using narrative synthesis. Study information, prevalence estimates and outcomes were summarised descriptively in text and tables, given heterogeneity in study design, populations and outcome measures. No additional data preparation was required for this review, and no data conversions or imputation for missing statistics were necessary. Meta-analysis was not considered to be feasible due to small numbers and heterogeneity; therefore, publication bias was not formally assessed. Methodological issues were also synthesised narratively to contextualise findings.

Results

Database searching returned 19,927 results. After de-duplication, 11,836 titles and abstracts were screened, resulting in 67 studies being eligible for full text review. Three full texts had to be requested from authors; none were received, resulting in the full text of 64 studies being reviewed. During full-text review, seven studies were identified that examined outcomes using data from the English and Romanian Adoptees (ERA) project, with the same participant cohort contributing follow-up data across multiple time points and publications. Following discussion with research supervisors, only the latest follow-up study for each outcome that met all other inclusion criteria was included. This excluded five studies (Edwards, 2024; Golm, 2021; Rodriguez-Perez, 2023; Rutter et al., 2010; Sonuga-Barke et al., 2017). This approach ensured that participant data were not counted more than once and that sample overlap was avoided in the current review. Full text review therefore resulted in the removal of 58 studies that did not meet all inclusion criteria or were excluded due to sample overlap. Six studies were also identified from Google Scholar, of which five did

not meet all inclusion criteria. This process resulted in seven studies that met all inclusion criteria and were included in the final review.

Study Information

Key study information and sample characteristics are reported in Table 1. The seven included studies were published between 1995 (Fergusson et al., 1995) and 2022 (Miller et al., 2022). Six of these were peer-reviewed, published articles, and one (Audet, 2008) was grey literature. All studies were conducted in high-income countries: two in the UK (Kennedy et al., 2016; 2017), two in the US (Crea et al., 2017; Liao et al., 2017), one in Canada (Audet, 2008), one in New Zealand (Fergusson et al., 1995), and one employed a multi-country European design across France, Italy, Norway, and Spain (Miller et al., 2022). Four studies employed longitudinal cohort designs (Fergusson et al., 1995; Audet, 2008; Kennedy et al., 2016; 2017), two used secondary analyses of cohort data (Crea et al., 2014; Liao et al., 2017) or cross-sectional survey designs (Miller et al., 2022). Two studies (Kennedy et al., 2016; 2017) used the same longitudinal sample from the ERA project but reported on different outcomes, thus were both included.

Table 1

Key characteristics of included studies

Author (year)	Country	Study design	Adoptee sample (n)	Age (Mean/range)	Gender	Adoption characteristics	Comparison group(s)
Fergusson et al. (1995)	New Zealand	Longitudinal cohort	n=32	15–16	Not reported numerically	Not reported	Two-parent & single-parent biological families (outcomes not extracted)
Audet, (2008)	Canada	Longitudinal cohort (phase 4)	n=37 *Romanian adoptees n=22* *Early adoptees n=15*	Mean=16	Romanian adoptees: 12 boys	Romanian adoptees ≥9 months deprivation Early adoptees <4 months	Canadian-born non-adopted controls n=33
Crea et al. (2014)	US	Longitudinal cohort (secondary analysis; wave 4)	n=449	Mean=16.7 (SD 2.5)	Males (51.4%) Females (48.6%)	Mean age at adoption 3.4y (SD 2.5)	No comparison group

Author (year)	Country	Study design	Adoptee sample (n)	Age (Mean/range)	Gender	Adoption characteristics	Comparison group(s)
Kennedy et al. (2016)	UK	Prospective longitudinal	n=164 *HiDep n=72* *LoDep n=92*	HiDep Mean=23.6 (SD 0.81) LoDep Mean=23.2 (SD 0.77)	Females: HiDep (54.2%) LoDep (46.7%)	HiDep >6 months institutional deprivation LoDep <6 months institutional deprivation	LoDep group n=42; included UK-adopted/non-deprived adoptees
Kennedy et al. (2017)	UK	Prospective longitudinal	n=107	Mean=23.6	91 females (≈85%)	<6 months institutional deprivation 6–43 months institutional deprivation	UK-adopted/non-deprived adoptees n=39 (outcomes for controls not extracted)
Liao et al. (2017)	US	Cross-sectional	n=412	Mean=16	Not reported	Not reported	No comparison group
Miller et al. (2022)	France, Italy, Norway, Spain	Cross-sectional	n=685	Mean=14.98 (SD 1.71)	Male (58%)	International adoption: Eastern Europe 44% Non-Eastern Europe 56% Mean age at adoption ~4.5y	No comparison group

HiDep – high deprivation; LoDep – low deprivation; SD – standard deviation; UK – United Kingdom; US – United States

*Statistical analysis was reported: no significant gender differences across birth-placement groups: (chi-squared; $\chi^2 = 1.48$, $p > .40$)
The sample includes adolescents under 15,** and results are not stratified by age ≥1

Sample Characteristics

Adoptee sample sizes ranged from n=32 (Fergusson et al., 1995) to n=685 (Miller et al., 2022) participants. Larger samples were typically drawn from secondary datasets, while smaller samples were characteristic of large-scale research using longitudinal cohorts. Five studies used adolescent samples aged between 15 and 16 years old to the nearest year (Fergusson et al., 1995; Audet, 2008; Crea et al., 2014; Liao et al., 2017; Miller et al., 2022), and two studies used samples of young-adult participants aged 22-25 years old (Kennedy, 2016; 2017). Five studies reported mixed gender samples (Audet, 2008; Crea et al., 2014; Kennedy et al., 2016; 2017; Miller et al., 2022), one did not report gender (Liao et al., 2017) and one (Fergusson et al., 1995) reported statistical but not numerical gender data.

Three studies reported Romanian-born adoptees now living in Canada (Audet, 2008) and the UK (Kennedy et al., 2016; 2017). One study (Crea et al., 2014) reported an all-African American sample. Two studies provided detailed ethnicity data: Liao et al., (2017) reported their sample as white (55.0%), Latino/Latina (17.8%), Asian (8.5%), black (6.2%), and other (1.1%), and Miller et al., (2022) reported the continent of origin for adolescents in their sample as Africa (n=75), Asia (n=140), Central America/Caribbean (n=169), Eastern Europe (n=298), and the Pacific and Middle East (n=3).

Adoption Characteristics

Three studies reported pre-adoption prolonged institutional deprivation as ≥ 9 months (Audet, 2008) and ≥ 6 months (Kennedy et al., 2016; 2017). Two studies reported mean age at adoption as approximately 4 years old (Crea et al., 2014; Miller et al.,

2022), one study reported mean age of adoption finalisation as eight years old (Liao et al., 2017), and one study did not report adoption characteristics (Fergusson et al., 1995). Four studies included international adoptees (Audet, 2008; Kennedy et al., 2016; 2017; Miller et al., 2022). Non-adopted or comparison groups were reported in four studies; these included two using domestically adopted controls (Audet, 2008; Kennedy et al., 2017), one with family-based controls (Fergusson et al., 1995), and one study (Kennedy et al., 2016) reporting a comparison group as "low or no deprivation" with no further aggregation. Three studies analysed adopted samples only (Miller et al., 2022; Crea et al., 2014; Liao et al., 2017)

RAD, DSED and Neurodivergence Outcomes

Key outcome information is summarised in Table 2.

Prevalence

Across the seven included studies, six reported prevalence data for ADHD (Fergusson et al., 1995; Audet, 2008; Crea et al., 2014; Kennedy et al., 2016; Liao et al., 2017; Miller et al., 2022), one reported on autism (Liao et al., 2017), one reported on learning disability (Liao et al., 2017), and one reported on DSED (Kennedy et al., 2017). No included studies reported prevalence estimates for RAD, developmental language disorder (DLD), developmental coordination disorder (DCD), tic disorders or Tourette syndrome.

Reported prevalence rates of ADHD among adopted adolescents and adults varied widely. The highest rates were reported for adoptees exposed to prolonged deprivation in Romanian institutions, e.g., 33.3% of adolescent adoptees (Audet, 2008) and 29.3% of young adults (Kennedy et al., 2016). Audet (2008) also reported a

prevalence rate for ADHD of 18.8% for adolescents who experienced less than four months in Romanian institutions prior to adoption, and 5.9% for a control group of adolescents who were never adopted. Kennedy et al. (2016) reported an ADHD prevalence of 5.9% young adults exposed to low deprivation, i.e., less than six months deprivation.

Elevated ADHD prevalence was also observed in broader adoptive samples. Crea et al. (2014) reported that 33.2% of adoptees had ever received an ADHD diagnosis. One study (Miller et al., 2022) reported caregiver-reported ADHD in 30% of internationally adopted adolescents, with higher prevalence among Eastern European adoptees (41%) than non-Eastern European adoptees (22%). One study (Fergusson et al., 1995) reported a higher ADHD prevalence rate of 15% among adolescent adoptees born into single-parent families, compared to those who were adopted or born into two-parent families, where ADHD prevalence was 9.4% and 5.6%, respectively. Liao et al. (2017) reported a prevalence of 13.4% for ADHD in their adolescent sample, the highest of all reported neurodevelopmental differences in their study.

Table 2

Outcome data of included studies

Study	Presentation /Diagnosis	Reported prevalence – exposure group(s)	Reported prevalence – control/comparison group(s)	Assessment tools used	Co-occurrence (if reported)	Impacts (if reported)
Fergusson et al. (1995)	ADHD	Adopted 9.4%	Two-parent families 5.6% Single-parent families 15.0%	DISC – to determine whether adolescents met DSM-III-R criteria for ADHD and other disorders based on parent or self-report; RBPC – parent-reported symptom data contributing to ADHD classification	Not reported	Not reported
Audet, (2008)	ADHD	Romanian adoptees 33.3%	Early adoptees 18.8% Canadian-born 5.9%	Parent-reported clinical diagnosis of ADD/ADHD	Not reported	Higher ADHD symptoms linked to increased behavioural difficulties and functional challenges at home and school (primarily parent/teacher ratings)

Study	Presentation /Diagnosis	Reported prevalence – exposure group(s)	Reported prevalence – control/comparison group(s)	Assessment tools used	Co-occurrence (if reported)	Impacts (if reported)
Crea et al. (2014)	ADHD; *ADHD symptomatology (inattention & hyperactivity)*	33.2% (n=149/449) had ever received ADHD diagnosis	‡	Parent-reported prior diagnosis (yes/no); CPRS-R (Mean score = 22.1 [SD 18.0])	Not reported	Higher ADHD symptom scores associated with more behavioural problems
Kennedy et al. (2016)	ADHD	HiDep 29.3%	LoDep 3.8% (risk ratio ≈ 7× higher for HiDep)	Parent report of diagnosis; CBRS for DSM-5–equivalent childhood ADHD criteria; Developmental history for continuity	ASD and DSE(D) traits assessed dimensionally; IQ treated as covariate	ADHD symptoms clinically impairing; adults with deprivation-associated ADHD had functional impairments independent of IQ
Kennedy et al. (2017)	DSE(D)	>6 months institutionalised 35%	<6 months institutionalised 5% UK non-adoptees ~5%	Semi-structured parent interview; Adult-adapted DSE(D) symptom scale	Symptom overlap with ASD and ADHD; IQ as covariate	Persistent DSE(D) associated with higher mental health service use, poorer educational attainment, employment outcomes, and functional impairment independent of IQ

Study	Presentation /Diagnosis	Reported prevalence – exposure group(s)	Reported prevalence – control/comparison group(s)	Assessment tools used	Co-occurrence (if reported)	Impacts (if reported)
Liao et al. (2017)	ID; ADHD; ASD	ID 2.2% ADHD 13.4% ASD 1%	‡	Caregiver report	Not reported	ID predicted increased parental burden (Cohen's d ≈ 0.79); no specific functional outcomes reported for ADHD/ASD
Miller et al. (2022)	ADHD	Total sample 30% *Eastern Europe 41% (n=228)* *Non-Eastern Europe 22% (n=300)*	‡	Parent report of diagnosis (not clinically verified)	Broad caregiver-reported academic learning problems 40% Delayed milestones 9%	Lower maternal adoption satisfaction in families of children with ADHD; no direct functional outcomes reported for adolescents

‡ - denotes no applicable data

ADD – attention deficit disorder; ADHD – Attention Deficit Hyperactivity Disorder; ASD – autism spectrum disorder; CBRS – child's behaviour rating scale; CPRS-R – child's parent rating scale-revised; DISC – diagnostic interview schedule for children; DSE(D) – disinhibited social engagement (disorder); DSM-III-R – diagnostic and statistical manual of mental disorders – third edition – revised; DSM-5 **-** diagnostic and statistical manual of mental disorders – fifth edition**;** HiDep – high deprivation; IQ – intelligence quotient; LoDep – low deprivation; RBPC – revised behaviour checklist; SD – standard deviation; UK – United Kingdom.

*On CPRS-R raw scores ≥15 is indicative of clinical ADHD symptom range.

Parent report was the main method of collecting ADHD diagnostic information. Three studies used standardised measures or comparison to diagnostic standards (e.g., DSM or ICD criteria) to support parent reports. Fergusson et al. (1995) used the Diagnostic Interview Schedule for Children (DISC; Costello et al., 1992), which is based on DSM-III (APA, 1987) criteria, in keeping with publication date. Crea et al. (2014) used the Conners Parent Rating Scale-Revised (CPRS-R; Conners, 1997) to assess reported ADHD symptomology; adolescent ADHD symptoms were found to be in the clinically elevated range (M=22.1, SD 18.0). Kennedy et al. (2016) used the Conners Comprehensive Behaviour Rating Scale (CBRS; Conners et al., 2011) to assess parent reports against DSM-V equivalent childhood ADHD criteria, and a developmental history review was also conducted to assess continuity of symptoms. Three studies (Audet, 2008; Liao et al., 2017; Miller et al., 2022) used only parent report and did not clinically verify ADHD diagnosis.

Only one study reported on the prevalence of learning disabilities (Liao et al., 2017), using the term intellectual disability (ID). They reported ID in 2.2% of adopted adolescents. Reports were based on caregiver's report only. One study (Liao et al., 2017) reported a prevalence of 1% of adopted adolescents having autism. Reports were solely based on parent report. Prevalence of disinhibited social engagement disorder (DSED) was reported in one study (Kennedy et al., 2017), referred to as ‘disinhibited social engagement (DSE)’ by the authors. They reported that approximately 35% of individuals exposed to more than six months of institutional deprivation met criteria for DSED in young adulthood. This was compared to approximately 5% of those adopted before six months of age and approximately 5% of UK non-adopted controls. The study used a semi-structured parent interview and an

adult-adapted DSED symptom scale, used in previous ERA studies, to assess symptoms. The authors also report that interviewers blinded to previous DSED status observed adoptees' behaviours during interview visits.

Co-occurrence

Across all seven studies, co-occurrence of any neurodivergence or of RAD and/or DSED was not reported, with clinical diagnoses being assessed in isolation. Two studies did report on multiple neurodevelopmental differences (Liao et al., 2017; Miller et al., 2022), but co-occurrence rates were not provided. Both ERA studies (Kennedy et al., 2016; 2017) reported dimensional associations, i.e., measuring symptoms on a continuum such as severity rather than as categorical diagnoses. In Kennedy et al. (2016), ADHD in high-deprivation young adult adoptees was associated with elevated autism and DSED traits. One study also reported that DSED in young adulthood overlapped with ADHD symptoms, autism symptom traits, and cognitive impairment (IQ), but no formal diagnoses were reported.

Impact

The impact of neurodivergence was reported for six studies. For ADHD, two studies found parent-reported ADHD symptoms to be associated with greater behavioural difficulties (Audet, 2008; Crea et al., 2014). Two studies reported functional impairments associated with ADHD. One reported on difficulties at home and school in adolescents (Audet, 2008). One (Kennedy et al., 2016) reported that ADHD symptoms in high-deprivation adoptees were clinically impairing and persisted into young adulthood, with functional impairments evident independently of IQ. Two studies (Fergusson et al., 1995; Liao et al., 2017) did not report ADHD-specific functional impairments or life outcomes.

Kennedy et al. (2017) reported that adults with DSED initially showed higher rates of mental health service use, as well as poorer educational attainment, employment outcomes, and greater functional impairment; however, these associations were accounted for by co-occurring ADHD symptoms rather than DSED alone. Finally, two studies reported on the impact of an adolescent's presenting difficulties on their parents. One (Liao et al., 2017) reported ID to significantly predict increased parental burden even after controlling for child behavioural problems and multiple disabilities (Cohen’s d ≈ 0.79). One (Miller et al., 2022) also reported that mothers of children with ADHD, behavioural or psychiatric problems, consistently reported lower adoption satisfaction, regardless of adoption status. However, this is not reported solely for ADHD as a differentiated presentation.

Critical Appraisal

The methodological quality and risk of bias of the included studies were appraised using the Joanna Briggs Institute (JBI) critical appraisal tools appropriate to each study design. Completed tables available in Appendix C. Five longitudinal cohort studies (Ferguson et al., 1995; Audet, 2008; Crea et al., 2014; Kennedy et al., 2016; 2017) were appraised using the JBI Cohort Checklist (Moola et al., 2020), and two cross-sectional studies (Liao et al., 2017; Miller et al., 2022) were appraised using the JBI Prevalence Checklist (Munn et al., 2020)

Cohort Studies

Two cohort studies demonstrated strong ratings across most JBI domains (Kennedy et al., 2016; 2017). These prospective longitudinal studies, from the ERA cohort, demonstrated well-characterised exposure classification, appropriate

identification and control of confounding variables, and sufficient reporting of follow-up from childhood into adulthood, including a clear distinction between data from different time-points. Robust outcome assessment was supported using standardised assessment tools and incorporation of developmental histories, enhancing confidence in the validity of parent-reported diagnoses of ADHD (Kennedy et al., 2016) and DSED (Kennedy et al., 2017) in young adulthood.

Limitations include small sample sizes, overlapping samples, and a focus on the unusual context of institutional deprivation. Fergusson et al. (1995) and Crea et al. (2014) also compared parent reports of ADHD against diagnostic criteria, strengthening outcome validity. While Fergusson et al. (1995) and Audet (2008) benefited from longitudinal designs, these studies were limited by small sample size, reducing the reliability and generalisability of findings. Furthermore, loss to follow-up and attrition rates were insufficiently reported, resulting in uncertainty regarding selection bias at later assessment points. Additionally, Audet (2008) relied exclusively on caregiver-reported diagnoses, without independent validation, increasing the risk of outcome misclassification bias. These limitations reduced overall methodological rigour for these studies. Across studies, it was unclear whether conditions were established prior to maltreatment exposure.

Cross-sectional Studies

The two cross-sectional studies (Liao et al., 2017; Miller et al., 2022) provided large-scale descriptive data on neurodevelopmental differences. They clearly defined inclusion criteria and provided adequate descriptions of participant characteristics. They both relied on parent-reported diagnoses. This reliance on caregiver report represents the primary source of risk of bias in outcome measurement across cross-

sectional studies. Information on response rates was unclear in both studies, conferring increased risk of non-response bias. The mean age range of Miller et al. (2022) fell within the specified limits of this review, but the study included younger participants and did not provide age-stratified prevalence estimates, limiting the applicability of findings to adopted populations aged 15 years or older.

Discussion

This systematic review synthesised evidence on the prevalence, co-occurrence, and impact of RAD, DSED and neurodivergence among adopted adolescents and adults. Despite the substantial global prevalence of adoption (Ligier et al., 2022) and recognition of the long-term effects of CM (Dinkler et al., 2017; Seim et al., 2022; Sonuga-Barke et al., 2017), only seven studies met the inclusion criteria. ADHD emerged as the most reported neurodevelopmental difference, with DSED, autism, and learning disability being reported less frequently. RAD, DLD, DCD, Tics and Tourette's were found to be absent from the literature for adolescent and adult adoptees. Yet taking DLD, for example, up to 68% of care experienced young people are thought to have speech, language and communication needs (Maguire et al., 2021). No included study provided categorical co-occurrence estimates. Where functional outcomes were available, these show lifelong impairments in social, emotional and academic/occupational functioning.

Of the included studies, notably, none were intended to be prevalence studies, and most drew on contexts of extreme early deprivation, particularly institutionalisation, limiting the generalisability of findings to the broader spectrum of maltreatment experiences preceding adoption. The scarcity of research likely reflects

the historical focus on childhood outcomes (particularly for RAD and DSED), a need for wider research in community samples, and diagnostic ambiguity pertaining to neurodevelopmental differences in previously maltreated populations (Gillberg, 2010; Minnis, 2013). These limitations reinforce the importance of this review in highlighting knowledge gaps regarding experiences of, and challenges faced by, adolescent and adult adoptees.

Prevalence Patterns and Prolonged Deprivation

Among neurodevelopmental differences, ADHD emerged as the most consistently reported presentation across adolescent and adult adoptees, consistent with existing literature (Askeland et al., 2017; Behle & Pinquart, 2016; Melero & Sánchez-Sandoval, 2017; Sánchez-Sandoval et al., 2020; Zournatzidis et al., 2025). This is perhaps not surprising considering the co-existence of neurodivergence and CM (Dinkler et al., 2017; Minnis, 2013; Zarei et al., 2021), and that the externalised nature and increased psychosocial risks associated with ADHD often attract research opportunities (Ligier et al., 2022). When ascertaining diagnoses of ADHD, the use of parent-report alone, even when compared against diagnostic criteria, without corroborating against teacher or self-reports, may have inflated prevalence estimates or underestimated subclinical difficulties. Variability in prevalence, therefore, likely reflects both sample characteristics and assessment methods.

Markedly elevated ADHD and DSED rates were reported in those exposed to prolonged institutional deprivation, with lower prevalence among those adopted earlier or exposed to minimal deprivation. This supports the notion of a stepwise associations between early adversity and some enduring maltreatment-associated

disorders (Audet, 2008; Kennedy et al., 2016; 2017; Miller et al., 2022; Sonuga-Barke et al., 2017). For ADHD, this is also reflective of the well-established life-long trajectory (Gillberg, 2010). However, taken together with Fergusson et al., (1995) finding a higher prevalence of ADHD among adolescents raised in single-mother families, compared to their adopted peers, this suggests a complex interplay of genetic and familial factors, early adversity and environmental stress should be considered (Bali et al., 2023). However, similar patterns have also been reported for other neurodevelopmental differences in the context of CM (Dinkler et al., 2017; Janjid et al., 2025), indicating a wider, multifaceted impact and expression.

Reflecting the scarcity of RAD and DSED research (Davidson et al., 2015; 2024), only one study reported on DSED (Kennedy et al., 2017), and no prevalence data was found for RAD in older adolescent and adult adoptees. This absence of RAD is perhaps consistent with evidence of symptom attenuation following placement in stable and nurturing environments (Humphreys et al., 2017; Nelson et al., 2022). However, it may also reflect under-reporting due to diagnostic overshadowing and conceptual ambiguity in older populations (Minnis et al., 2013).

Although limited, evidence of DSED in young adults not only challenges early assumptions that attachment disorders are confined to early childhood and adolescence (Humphreys et al., 2017; Seim et al., 2022) but highlights the important role of adoptees in understanding trajectories that may otherwise be unobservable in populations who remain in alternative care systems. Importantly, Kennedy et al. (2017) are researchers with experience of the ERA study. They appear to have considered potential self-reporting bias in their classification of DSED by utilising behavioural observations of participants alongside parent reports. This may offer an

objective perspective, strengthen clinical interpretation and increase confidence in the accuracy of prevalence reports. However, limited methodological detail regarding observational procedures introduces potential for observer expectancy effects and reduced reproducibility across independent samples. The prevalence of autism and learning disabilities was broadly comparable to general population rates. For cognitive impairment, this supports the notion of developmental *catch-up*, rather than permanent impairment, associated with early deprivation (Jangid et al., 2025; Sonuga-Barke et al., 2017). However, the lack of research on autism in adolescent and adult adoptees does not align with evidence of elevated autism prevalence in adopted children (Gillberg, 2010; Green et al., 2016), which would be expected to persist into adolescence and adulthood, particularly given that symptom severity appears to remain relatively stable or even increase over time (Rodrigeuz-Perez et al., 2023). Absence of data for developmental language disorder (DLD), developmental coordination disorder (DCD), tic disorders, or Tourette's syndrome may reflect under-identification, particularly in the context of presentations that are less externalised and therefore less visible to caregivers or researchers (Ligier et al., 2022).

Co-occurrence and Diagnostic Complexity

A critical finding of this review was the lack of formal reporting on co-occurrence between RAD, DSED, and neurodivergence across all included studies. Dimensional analyses from Kennedy et al. (2016; 2017) indicated associations between ADHD symptoms, elevated autistic traits, and DSED behaviours in young adulthood. However, categorical co-occurrence data were absent, preventing meaningful estimation of prevalence. Poor understanding of co-occurrence beyond

childhood exacerbates documented challenges in differential diagnosis (Gillberg, 2010; Minnis, 2013). For example, inattentive or hyperactive behaviours can be misattributed to maltreatment-associated difficulties and attachment disorders, while social disinhibition might mask autistic traits or executive function challenges.
Such diagnostic complexity likely contributes to ongoing misdiagnosis and delayed identification, which are likely compounded by psychosocial pressures through the life stages, to impact on poorer mental health and life outcomes for adopted adults, in particular (Ligier et al., 2022). This failure of the literature to address co-occurrence represents a major limitation for research and clinical practice, as the true burden of complex presentations remains largely unquantified, and without clearer prevalence and co-occurrence data, inappropriate service planning may persist. Addressing this gap requires standardised, multi-informant assessments that capture both categorical diagnoses and dimensional symptom profiles, alongside longitudinal follow-up to examine developmental trajectories (NICE, 2015).

Functional impact

Where reported, functional outcomes highlight the enduring impact of neurodivergence and DSED. ADHD was associated with behavioural difficulties at home and school, consistent with heightened externalising behaviour, attention regulation challenges, and impaired executive functioning (Audet, 2008; Crea et al., 2014). DSED was linked to lower educational attainment, increased mental health service use, and functional impairments extending into young adulthood (Kennedy et al., 2016; 2017). Crucially, functional impairments were often independent of IQ,

highlighting that cognitive ability does not fully mitigate the functional consequences of early adversity.

Relational and systemic impacts were also apparent. Increased parental burden and reduced adoption satisfaction were reported in families of children with ADHD, and other behavioural or neurodevelopmental difficulties (Liao et al., 2017; Miller et al., 2022), demonstrating that neurodevelopmental and maltreatment-associated needs extend beyond the individual to affect family functioning. These findings emphasise the importance of considering environmental, relational, and systemic contexts in both research and clinical intervention planning, as unmet needs may compound psychosocial stressors and exacerbate long-term difficulties (Bali et al., 2023; Ligier et al., 2022; Minnis, 2013; Turner et al., 2022).

While functional outcomes were most often reported in adolescence and young adulthood, there is a dearth of research extending into later adulthood. Given the lifelong persistence of neurodevelopmental differences and evidence of enduring impairment from early maltreatment, outcomes beyond age 25 remain poorly understood. This gap constrains service planning and highlights the need for longitudinal studies extending into mid and later adulthood to capture the full trajectory of these presentations (Melero & Sánchez-Sandoval, 2017; Sonuga-Barke et al., 2017; Zournatzidis et al., 2025).

Research Implications

Reflecting the findings of previous reviews, heterogeneity in assessment tools, diagnostic criteria, and outcome measures complicated synthesis and reduced comparability across studies (Fan & Kang, 2025; Jangid et al., 2025). Moreover, most

studies relied heavily on subjective caregiver reports for outcome ascertainment, often without independent clinical verification, increasing the risk of misclassification and biased prevalence estimates (Audet, 2008; Liao et al., 2017; Miller et al., 2022). These limitations underscore the need for multi-informant, developmentally sensitive, and clinically verified approaches in future research, in line with existing clinical guidelines for assessing people with maltreatment histories, including adoptees (NICE, 2015).

Research priorities should therefore include the systematic assessment of co-occurrence, the use of multi-informant clinically verified diagnoses, and the inclusion of a wider spectrum of neurodevelopmental differences. Longitudinal designs extending into adulthood are particularly critical to capture evolving symptom trajectories, functional outcomes, and interactions between individual, familial, and environmental factors. Adoptees offer unique opportunities to explore the impact of stability in long-term care settings (Fisher, 2015) and observe the full developmental and functional trajectory of co-existing experiences of neurodivergence and maltreatment over time (Zarei et al., 2021). Importantly, this includes the potential for exploring recovery, persistence, or emergence of difficulties in adolescence and adulthood following CM (Melero & Sánchez-Sandoval, 2017; Rodrigeuz-Perez et al., 2023; Sonuga-Barke et al., 2017). Therefore, understanding the needs of this population beyond young adulthood may inform service delivery frameworks from a developmental, rather than diagnostic, categorical perspective.

Clinical Implications

Findings of this review also highlight the necessity of nuanced, developmentally informed clinical practices for adopted adolescents and adults

(Fisher, 2015; NICE, 2015). Increased prevalence of ADHD, the persistence of DSED, associations between symptom severity and exposure to CM and overlapping presentations emphasise the need for early identification, longitudinal monitoring, and tailored intervention planning (Gajwani & Minnis, 2023). Assessment pathways should strive to move beyond single-explanatory frameworks toward integrated neurodevelopmental and maltreatment-informed practices, supporting Hiller et al.'s (2023) call for all care experienced populations to receive holistic assessment that should explicitly consider neurobiological influences, pre-adoptive adversity and wider care experiences and RAD or DSED (Bali et al., 2023; Dinkler et al., 2017; Jangid et al., 2025; Minnis, 2013). Consistent with trauma informed practice, services utilising this holistic approach may promote equitable care guided by individual formulation rather than diagnosis-led threshold for support (Gajwani & Minnis, 2023).

The relative absence of RAD, DSED and other neurodevelopmental differences such as developmental language and co-ordination disorders, in adolescent and adult adoptee research should not be interpreted as absence of need. This is particularly important in social care contexts where adopted children and their families frequently receive less ongoing statutory support than other populations who have experienced CM, despite presenting with comparable levels of need (Woolgar et al., 2024). Health and social care services are therefore encouraged to recognise that adoption does not mitigate developmental vulnerability but represents an ongoing developmental context across the lifespan. Professionals should remain curious about how attachment-related and neurodevelopmental presentations may evolve and impact functioning over time (Ligier et al., 2022; Sánchez-Sandoval et al., 2020; Sonuga-Barke et al., 2017). A lifespan-orientated approach requires proactive multi-agency

screening, continuity across transitions and interventions targeting relational, emotional and adaptive functioning alongside symptom-focused care.

Limitations

The current review used a comprehensive search strategy, including grey literature, to focus on the underrepresented population of adoptees. The initial protocol applied limits in terms of participant age. However, during screening and searching, it became apparent that the number of results being yielded was not feasible for this level of research. Therefore, after further consultation with the evidence base and discussion with the researcher's clinical supervisor, an age parameter of 15 years old or older was set. Due to the scarcity and heterogeneity of the research, a meta-analysis was not conducted. Further, the two most robust studies (Kennedy et al., 2016; 2017) used the same data set from the ERA studies and other available estimates were often based on subject reports, meaning pooled estimates would be misleading.

Conclusion

This narrative synthesis has demonstrated that ADHD is the most prevalent and impactful neurodevelopmental difference reported among adopted adolescents and adults, particularly in those exposed to prolonged early deprivation. While DSED also persists it is, alongside autism and learning disabilities, reported less frequently. RAD and other common neurodevelopmental differences remain under-researched. The absence of co-occurrence data and reliance on heterogeneous (predominantly caregiver-reported outcomes) limit confidence in current estimates. The upper age limit of samples falls within the young adult range, which may have specific

implications for service structure and access in some policy contexts. Addressing these gaps is essential for improving diagnostic accuracy, informing interventions, and supporting optimal long-term outcomes for adopted individuals transitioning into adulthood.

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Chapter 2

“There Has to Be Something Better for People That Come After Us”: Parents’ Experiences of Holistic Understanding and Support for Their Children with Maltreatment Histories

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*To demonstrate the required research competencies for this Doctoral thesis the maximum word limit for the target journal has been exceeded, the word count will be adhered to for publication.

Plain Language Summary

Title

"There Has to Be Something Better for People That Come After Us": Adoptive parents' Experiences of Seeking Broad Understanding and Support for Children with Maltreatment Histories.

Background

Children who have previously been maltreated are at increased risk of attachment-disorders – reactive attachment disorder (RAD) or disinhibited social engagement disorder (DSED). Neurodevelopmental differences, such as attention deficit/hyperactivity disorder (ADHD) and autism, are also common in children who have experienced maltreatment. Some behaviours across these diagnoses overlap, making it difficult to understand children's needs. This can lead to diagnoses being missed, or inaccurate diagnoses being given, leading to inappropriate support. Parents play a key role in seeking help for their children, but their perspectives are not often reported in research.

Aims and Questions

The study aimed to explore adoptive parents' experiences of how their child's difficulties were understood and supported. Particular attention was paid to whether both attachment-related and neurodevelopmental perspectives were considered and/or explored by services. It was hoped these experiences would help to inform practice for professionals who work with previously maltreated children, by answering these questions:

(1) What are parents' experiences of their child's behaviours and difficulties being understood and supported broadly (consideration of possible neurodivergence and/or RAD or DSED) by services, where their child has previously experienced maltreatment?

(2) How did adoptive parents' experiences of support during the Relationships in Good Hands (RIGHT) trial compare to previous support-seeking, with regards to broad consideration of both neurodivergence & RAD/DSED?

Methods

Participants: Parents of adopted children (aged 5-12) taking part in the Relationships In Good Hands Trial (RIGHT). Ten parents took part in the study.

Recruitment: Participants from the RIGHT trial were contacted and information about the proposed study was shared with them. These were participants whose scores on two standardised questionnaires, completed at the start of their involvement in RIGHT, suggested a child might be showing potential symptoms of RAD, DSED, or neurodevelopmental differences. The researcher then called potential participants to discuss consent to participate.

Design: A qualitative design using reflexive thematic analysis to identify patterns of meaning across parents' experiences.

Data collection: Ten individual online interviews lasting approximately one hour. With consent, these were audio and video recorded. Recordings were then transcribed for analysis.

Main Findings and Conclusions

Three main themes were identified: (1) the struggle to be heard, (2) recognition without resolution, and (3) DDP being more holistic than previous experiences of seeking support. These themes represented parents' journeys through disjointed systems where they experienced conflicting perspectives and felt left to make sense of complicated information on their own. Although DDP helped, a diagnosis of neurodevelopmental differences was also experienced as key to accessing support for their child. Findings highlight the need for approaches to understand and support children with maltreatment histories that consider both maltreatment-associated difficulties, such as attachment disorders, and neurodivergence. Services should consider how not doing this may delay support and add to the stress families experience when seeking support.

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Abstract

Background. Children who experience childhood maltreatment (CM) are at heightened risk of maltreatment-associated difficulties, including Reactive Attachment Disorder (RAD) and Disinhibited Social Engagement Disorder (DSED). The co-existence of CM and neurodevelopmental differences is also increasingly recognised. Literature suggests holistic approaches to understand and support this population are indicated but inconsistently reported in practice, and the perspectives of parents also remain largely under-explored.

Aim. This study examined parents' experiences of holistic approaches addressing potential maltreatment-associated attachment disorders *and* neurodevelopmental presentations.

Methods. Ten adoptive parents of children participating in the Relationships in Good Hands Trial were interviewed about their experiences of seeking holistic support for their child. In the current research, holistic refers to the consideration of neurodivergence *and* attachment disorders, simultaneously. Interviews were conducted and analysed using reflexive thematic analysis within a realist-essentialist framework to identify patterns of meaning in parents' accounts.

Key Findings. Three themes emerged: (1) struggling to be heard within fragmented systems, highlighting the interpretative burden and delays to holistic care; (2) recognition without resolution, reflecting diagnostic gatekeeping and partial recognition of needs; and (3) relational approaches as an additional holistic

perspective, where Dyadic Developmental Psychotherapy (DDP) was commonly experienced as supporting parents understanding through a holistic lens.

Conclusion. Parents are central advocates for holistic understanding, yet systemic barriers often impede integrated care. Relational approaches, like DDP, may offer meaningful support but require embedding within broader systemic frameworks to address complex maltreatment-associated and neurodevelopmental needs.

Keywords: *adoptees; attachment disorders; neurodevelopmental conditions; neurodevelopmental disorders*

Introduction

One in four children (Minnis, 2013; Zilberstein, 2023) experience childhood maltreatment (CM), defined as physical and/or sexual abuse, as well as emotional and physical neglect in early life. This period, including pre-natal exposure to adversity, represents a sensitive time that shapes the foundations of physical, cognitive, social, emotional and behavioural development (Marmot et al., 2010; Monk et al., 2012). Children who have experienced CM are more likely to be neurodivergent (Dinkler et al., 2017). However, adverse social-environment exposure, which disrupts attachment formation and brain maturation (Zeanah & Gleason, 2015) can increase traits such as poorer attention and concentration; traits that are otherwise more commonly associated with neurodivergence. There is also growing recognition of bidirectional developmental pathways between CM and neurodivergence (Bali et al., 2023; Jangid et al., 2025). When supporting children who have experienced CM, holistic perspectives to understand complexity should consider both maltreatment-associated problems, specifically attachment disorders as these are causally linked to CM, and neurodivergence due to the elevated rates of co-occurrence with CM (Gajwani & Minnis, 2023; Hiller et al., 2023; Minnis, 2013).

RAD, DSED and Neurodivergence

Experiences of social neglect, extreme deprivation and/or repeated changes in caregivers in early infancy severely limit opportunities to form selective attachments (Zeanah et al., 2016; Seim et al., 2022). Within diagnostic frameworks (American Psychiatric Association [APA], 2013; World Health Organisation [WHO], 2022), CM is causally related to the only two trauma and stressor disorders of childhood – reactive attachment disorder (RAD) and disinhibited social engagement disorder (DSED), also

known as attachment disorders. Core features of RAD include significantly reduced seeking and acceptance of comfort from caregivers and dysregulated emotional responses (Zeanah & Gleason, 2015). DSED is characterised by socially indiscriminate behaviour and reduced awareness of interpersonal boundaries (Guyon-Harris et al., 2019) and has been shown to be associated with poorer social competencies (Davidson et al., 2024).

Prevalence of RAD and DSED are elevated among looked-after and adopted children and young people. Although more commonly identified in younger children (Kay et al., 2016; Minnis et al., 2013), adolescents may also present with these attachment disorders (Humphreys et al., 2017; Nelson et al., 2023). Exposure to nurturing environments mitigates the features of RAD over time in most cases (Humphreys et al., 2017; Nelson et al., 2022). The course of DSED is less clear. Most research indicates persistence (Zeanah & Gleason, 2015; Kennedy et al., 2017), while other findings suggest symptoms may reduce or remit, but functional social-relatedness difficulties persist following removal from maltreatment environments (Guyon-Harris et al., 2019). Despite high-quality epidemiological research, RAD and DSED remain underrepresented in the literature (Davidson et al., 2024).

Neurodevelopmental differences (typically referred to as 'disorders' in research and clinical practice), including attention deficit/hyperactivity disorder (ADHD), autism, and learning disabilities, also typically emerge in early childhood (Gillberg, 2010). Neurodivergent presentations share core features including difficulties with social relationships, attention, impulse control, emotional regulation, social communication and sensory processing (Gillberg, 2010). The core features of RAD, DSED and neurodevelopmental differences can, on the surface, appear similar

(Davidson et al., 2022). For example, RAD and autism share reduced eye contact, impaired social understanding and difficulties with empathy. Similarly, the indiscriminate sociability and poor interpersonal boundaries characteristic of DSED (Zeanah & Gleason, 2015) may resemble the subgroup of autistic children who demonstrate social motivation and approach others readily, yet continue to experience core difficulties in social reciprocity, communication, and understanding social norms (Wing & Gould, 1979). Although subtle differences exist, core traits of ADHD, i.e., social impulsivity and poor inhibitory control are also found in pre-school and primary school age children with DSED (Follan et al., 2011; Bruce et al., 2009).

Co-occurrence and Complexity

Overlapping symptomologies likely contribute to categorical approaches in considering maltreatment-associated problems. Some literature argues that existing diagnoses of ADHD or autism may take precedence, at the expense of considering interpersonal and environmental risk factors such as CM (Berg et al., 2018; Richards, 2013). However, behavioural differences in maltreated fostered and adopted children may often be interpreted as attachment-related, with neurodevelopmental explanations overlooked (Allen & Schuengel, 2020; Woolgar & Baldock, 2015). Woolgar and Baldock (2015) reported that 16% of adopted children had previously been diagnosed with RAD, DSED or ‘attachment disorders’, yet only 2% met diagnostic criteria when reassessed. Such misunderstanding of the term ‘attachment disorder’ and/or siloed approaches may delay identification of co-occurring presentations and appropriate support (Hiller et al., 2023; Zilberstein, 2023).

Evidence indicates likely co-existence of CM and neurodivergence (Gajwani & Minnis, 2023). Children who have experienced CM are seven times more likely to present with two or more, and six times more likely to present with three or more, neurodevelopmental differences (Dinkler et al., 2017), and ADHD is two-and-a-half times more prevalent among adolescents with DSED (Seim et al., 2022). Rates of neurodivergence are higher in care-experienced young people yet are frequently under-recognised in assessment pathways dominated by trauma frameworks (Cawthorne & Woolgar, 2025). This is also true for RAD and DSED (Minnis, 2013). Diagnostic overshadowing may contribute to unmet needs and poorer outcomes, highlighting the need for integrated approaches (Gajwani & Minnis, 2023; Hiller et al., 2023). Many children who experience CM are not neurodivergent and do not develop RAD or DSED. However, research recognises a distinctive profile of complex psychiatric and neurodevelopmental presentations in this population, referred to as maltreatment-associated psychiatric problems, suggesting that where one presentation is apparent, co-occurrence may be the rule, rather than the exception (Minnis, 2013).

Accurate conceptualisation of co-occurrence is essential for effective formulation, diagnosis and intervention for maltreated children and young people (Hiller et al., 2023; National Institute for Health and Care Excellence [NICE], 2015; 2019b). This includes understanding the heightened risk of co-occurrence in maltreated populations (Dinkler et al., 2017; Seim et al., 2022). A syndemic approach, which understands complexity as synergistic, i.e., arising from combined co-occurring factors (Vereeken et al., 2023), may offer a framework to do this.

Current Recommendations

CM is associated with poorer mental health and reduced academic/vocational attainment (Gajwani & Minnis, 2023; Sonuga-Barke et al., 2017), contributing to increased pressure on services (Conti et al., 2021). Political and clinical drivers emphasise timely, integrated, developmentally appropriate assessment and support (NICE, 2015; 2017; 2019; Scottish Government, 2023), particularly for children with RAD and/or DSED who remain underrepresented in research (Davidson et al., 2024; Zilberstein, 2023). Clinical guidelines for supporting adopted and maltreated CYP (NICE, 2015; 2017b; 2019b) stipulate that co-existing mental health and neurodevelopmental differences should be recognised and assessed. Guidelines for neurodevelopmental assessment also note CM as a differential diagnosis when assessing for autism (NICE, 2017a), and ADHD guidelines recommend awareness of increased prevalence in care-experienced populations (NICE, 2019a).

There is no gold-standard treatment for RAD or DSED. Recommendations often focus on parenting-based therapies, with attachment-specific interventions recommended for adopted children under five (NICE, 2015; 2017b; 2019b). Dyadic Developmental Psychotherapy (DDP; Hughes, 2017) aims to promote relational safety, emotional attunement and co-regulation by helping parents to reflect on their own, and their adopted child's, attachment experiences, considering how these shape the parent-child relationship. A review by Apeiranthitou (2021) reported reductions in RAD symptoms following DDP compared with usual care but concluded that evidence remains insufficient due to methodological limitations. This review did not report on DSED.

With recognition that attachment disorders may extend beyond early childhood (Humphreys et al., 2017; Zeanah & Gleason, 2015), there is a need to

evaluate attachment-focused interventions for older children (Minnis, 2021). For example, the Relationships in Good Hands Trial (RIGHT; clinical trials registration available here) is a definitive randomised controlled trial exploring the clinical and cost effectiveness of DDP compared to services-as-usual. It is being conducted by the Centre for Developmental Adversity and Resilience (CeDAR) at Glasgow University. Participants are adopted or permanently fostered children, aged 5–12 years with mental health difficulties, and their families. Families are randomly allocated to DDP or health and social care services-as-usual.

Evaluative research is important to ensure appropriate interventions are offered. For example, RAD is a disorder of attachment, therefore targeting the attachment relationship as the primary mechanism for change may be an effective intervention (Humphreys et al., 2017). Yet, for DSED, attachment interventions alone are unlikely to adequately address the indiscriminate sociability, impaired boundaries and social relatedness difficulties associated with DSED (Zeanah & Gleason, 2015; Zilberstein, 2023). Instead, preliminary interventions targeting social understanding, safety awareness and visual social-relationship mapping strategies have explored to support children with differentiation of relational closeness and appropriate social behaviours (Davidson et al., 2024; Zilberstein, 2023).

Regarding neurodivergence, environmental adaptations may more effectively reduce stressors and enhance accessibility. For example, sensory sensitivities, communication differences and impulsivity/hyperactivity characteristics of some neurodivergent profiles are unlikely to be best supported by attachment-focused interventions and are often better supported by environmental strategies implemented by those supporting the young person, rather than the individual

themselves (NICE, 2019a; 2021). In some cases, such as ADHD, medication may be required to reduce symptom severity, and psychoeducation and modelling may support communication and interaction skills, if appropriate (McCool, 2023).

Underrepresentation of Parent Perspectives

Difficulties in diagnosing and supporting RAD, DSED and/or neurodivergence raise ethical and clinical concerns. This is particularly important given the potentially lifelong nature of DSED and neurodivergence (Sonuga-Barke et al., 2017) and adverse health, mental health, educational and social outcomes associated with unsupported needs (Dinkler et al., 2017; Seim et al., 2022; Sonuga-Barke et al., 2017). Despite a rationale for holistically supporting all children who have experienced maltreatment (Hiller et al., 2023) research remains limited (Davidson et al., 2024; Zilberstein, 2023) and is largely skewed towards professionals' experiences of diagnostic uncertainty and differentiation challenges (Allen & Schuengel, 2020; Hiller et al., 2023).

Within child and adolescent systems, parents' hold a central role in advocating for their children. Yet, parents' experiences of services remain relatively underexplored. The limited research available indicates high levels of dissatisfaction, particularly for adoptive parents, pertaining to service access, poor communication and not feeling valued (Martin et al., 2025; Woolgar et al., 2024). The RIGHT context therefore confers a rich source of experiential insight, as parents have an active role in the research trial, and therefore the services offered, due to their children being aged 5-12 years. This offers a valuable opportunity to explore families' experiences and inform services improvements, to more effectively meet the needs of children, young people and adolescents, who have experienced maltreatment.

Current Study

The current study centred on parents' experiences of how their child's behaviours were understood when seeking support. Specifically, the project aimed to determine whether a holistic approach i.e. considering neurodivergence *and* the maltreatment-associated problems of RAD and DSED, was undertaken. The following research questions were addressed:

1. What are adoptive parents' experiences of the ways in which their child's presenting difficulties were understood and supported, and how were holistic approaches (consideration of ND, RAD or DSED) incorporated?
2. How were holistic approaches taken in the support that parents experienced during RIGHT?

Methodology

The current study aimed to explore parents' experiences of holistic approaches undertaken by services to support their child, regardless of which are of the trial (DDP or SAU) they were randomised into. The focus was regarding consideration of both neurodevelopmental differences *and* RAD and/or DSED (APA, 2013; WHO, 2022). The research was informed by the CORE-Q checklist (Appendix D) and was registered on the Open Science Framework.

Ethics

RIGHT is approved by the West of Scotland Research Ethics Committee 3 (Ref 20/WS/0039; Appendix F1). A substantial amendment (Appendix F2) to the existing trial protocol was approved to include the addition of EM (main researcher) to the RIGHT research team, adapted information sheets and consent forms and a new topic

guide. Research sites were informed of the research prior to recruitment commencing. A further non-substantial amendment (Appendix F3) was endorsed by the research sponsor. This was sought following rewording of the information sheet and consent forms following PPCI feedback to improve clarity for participants. Site access was sought in line with ethics (Appendix F4).

Design

The study implemented a qualitative design using reflexive thematic analysis (RTA) within a realist-essentialist framework (Braun & Clarke, 2022). This approach assumes that participants' accounts provide meaningful access to their lived experience, while recognising the researcher's active role in interpretation.

Materials

A topic guide was developed by the researcher to structure interviews in the current study (Appendix G). This was discussed with the patient, public and commissioner involvement (PPCI) groups affiliated with RIGHT. Feedback aligned with the researchers' own reflections during interviews, and language was adjusted to be more trauma informed and less clinical throughout.

Recruitment materials

In RIGHT, the Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001) and Reactive Attachment Disorder and Disinhibited Social Engagement Disorder Assessment Interview (RADA; Lehmann et al., 2020) were routinely collected at baseline for all participants.

- The SDQ is a standardised parent/caregiver-report screening questionnaire designed to assess children's emotional and behavioural functioning

(Goodman, 2001). Whilst the SDQ is not a diagnostic tool for neurodevelopmental differences, elevated scores in hyperactivity/inattention, peer relationship difficulties, and prosocial functioning domains have been associated with behaviours commonly observed in neurodevelopmental presentations, including ADHD and autism.

- The RADA is a semi-structured caregiver interview developed as part of a multi-informant assessment package to assess symptoms of RAD and DSED against diagnostic criteria (Lehmann et al., 2020). Caregiver report is considered particularly informative in the assessment of RAD and DSED (Lehmann et al., 2020; Zeanah et al., 2016).

Recruitment

Participants in this study were parents purposively sampled from families accessing RIGHT who had previously consented to take part in further research affiliated with the trial. The researcher had no prior affiliation with potential participants.

SDQ and RADA baseline data was obtained from the Roberston Centre for Biostatistics and was used only for sampling purposes. Eligibility was determined based on baseline data indicative of RAD, DSED and/or neurodivergence. In the current study, the hyperactivity/inattention, peer relationship difficulties, and prosocial functioning subscales of the SDQ were examined for scores in high and very high categories (i.e., ≥8), indicating behaviours commonly associated with neurodivergence. RADA data were used to identify cases meeting two or more of the core diagnostic criteria, i.e., the symptoms were rated “a lot”, to identify children who

may present with features of RAD and/or DSED. Qualitative caregiver examples were used for clarification. The researcher consulted with their research supervisors, who have expertise in the field, to discuss potential cases. Parents of the children were eligible if their baseline data was indicative of: (1) neurodevelopmental differences only, or (2) neurodevelopmental differences, RAD and/or DSED. Inclusion of these profiles was chosen to allow data to potentially explore whether symptoms of neurodivergence, or attachment disorders, may be overlooked in the context of trauma experiences.

Procedure

Participant numbers for forty-four parents identified as eligible for the current study were shared with community research nurses (CRNs) affiliated with RIGHT, with whom participants had established relationships. CRNs confirmed that five parents had withdrawn from RIGHT and three had been lost to follow-up. Therefore, thirty-seven parents who met the eligibility criteria were contacted by CRNs. Reasons for not progressing at this stage included personal circumstances (n=3), declining consent (n=2), and non-response to the CRN (n=2).

Eligible parents who expressed interest in the study (n=30) were subsequently provided with a participant information sheet and consent form (Appendix H). The main researcher (author) conducted follow-up telephone calls to discuss the study in more detail and invited parents to return the signed consent form by an agreed date to a secure University of Glasgow email address. At the request of one participant, hard copies were posted and returned in accordance with CeDAR guidance. Where consent forms were not returned, a reminder email was sent to parents, should they

still wish to participate. If consent forms were not returned following this reminder, no further contact was made. Reasons for non-return are therefore unknown.

One-off individual interviews (n=10), i.e., no repeats, were conducted by the researcher via Microsoft Teams at a date and time most suitable for the participants. Verbal consent was obtained on the day for interviews to be audio- or video-recorded. Non-identifiable field notes were also taken by hand. Interviews ranged from 35 minutes to one hour and 48 minutes, with an average length of 65 minutes. Participants were debriefed, thanked for their participation and advised that a summary of the research findings would be disseminated to them in due course. Following interviews, transcripts were generated from audio/video recordings by the research assistant for the RIGHT trial. Interview transcripts were pseudonymised, and electronic data (interview recordings and transcripts) were stored on a secure University of Glasgow server; access is restricted to the RIGHT research team. A data availability statement is provided in Appendix I.

Data Analysis

A data analysis plan, available in Appendix J, was developed prior to commencing data analysis. Reflexive thematic analysis focused on identifying patterns of shared experiences across the sample. The main researcher was the sole analyst, and the approach was informed by Braun and Clarke’s (2006; 2021) reflexive approach to thematic analysis, allowing flexibility and recursive movement between analytic activities. The data analysis process is available in Appendix K.

The researcher familiarised themselves with the data through repeated reading of interview transcripts. Initial analysis was completed line-by-line, using an

inductive and interpretative open coding, and supported by NVivo software. Through this process, provisional patterns of meaning were developed by organising codes into broader analytic themes. Themes and sub-themes were reviewed, refined, and developed including through reflexive discussion with the research supervisor, and the use of thematic mapping. Quotes were identified to illuminate meaning across themes (Braun & Clarke, 2022). Final themes were synthesised and presented in the written analysis.

RTA assumes that participants' accounts provide meaningful insight into their experiences and involves the researcher actively interpreting patterns of meaning within the data, as consistent with a realist-essentialist epistemology and an inductive semantic-level orientation. Codes and themes were developed through close engagement with the dataset, rather than imposed through pre-existing theoretical frameworks. Analysis primarily attended to participants' explicit accounts of experience, while remaining open to more implicit patterns of meaning where these were interpreted as analytically relevant. The researcher approached analysis as an iterative and reflexive process, recognising their active role in interpreting patterns of shared experience and reflecting on their influence throughout data collection and analysis.

Reflexivity Statement

The researcher's interest in the topic shaped decisions throughout the study, including project selection, research question development and approaches to data collection and analysis. Clinical experience with the population supported an ongoing reflexive stance, with attention to the researcher's social and professional positioning.

Being a white, female originally from a working-class background who is educated to MSc level in applied child and adolescent psychologist and a current trainee clinical psychologist at Doctoral level, shaped the research process (Burnham, 2018). Reflexivity focused on the researcher's familiarity with clinical practice and assessment processes, including the active avoidance of adopting an assessment stance during interviews.

As data collection progressed, the researcher kept reflexive notes to appraise their approach (Olmos-Vega et al., 2023). This, alongside PPCI feedback, resulted in adapting their language to support parents in exploring their own curiosities and articulating their own meanings, recognising the co-constructed nature of the data. During analysis, the researcher remained attentive to how contextual factors and professional experiences informed interpretation. This included familiarity with relevant literature, dominant discourse in clinical practice regarding maltreatment and neurodevelopment (Allen & Schuengel, 2020; Hiller et al., 2023) and families' frustrations with services (Martin et al., 2025). Reflexive engagement involved questioning initial assumptions, considering alternative readings of the data, and using supervision to support transparency in analytic decision-making (Braun & Clarke, 2022; Olmos-Vega et al., 2023).

Results

The final purposive sample included ten participants, which following the guidance of Braun and Clarke (2013; 2021; 2022) is an acceptable minimum number of participants for an RTA of this level to ensure adequate richness and saturation. Moreover, using an iterative research approach, the researcher reflected throughout

data collection and determined that ten participants provided sufficient analytic depth to develop rich patterns of shared meaning across the dataset (Malterud et al., 2016).

Sample Demographics

The sample consisted of nine mums and one dad of adopted children. All parents were married or in a co-habiting relationship, however all interviews were conducted with one parent only. All participants were white. The children of parent participants were seven boys and three girls, aged between six and twelve years old at intake to RIGHT, and seven and fourteen years old at the time of the current study. The age at which children were adopted ranged from six months to seven years. The age at which children were removed from their birth families ranged from at birth to approximately four years. All children lived with foster families prior to their adoption.

RIGHT Demographics

Of the families who took part in the current research, six had been allocated to the DDP arm of the RIGHT trial, and four to the service as usual arm. Families were recruited from both NHS and social care sites across Scotland, England and Wales. The time that families had been enrolled in the RIGHT trial ranged from one to five years.

Potential Neurodivergence and Maltreatment Demographics

All families reported that they had sought neurodevelopmental assessment for their child. The majority of these were prior to RIGHT, while some parents re-raised this query during RIGHT, which led to assessment in some cases. ADHD was assessed for in seven children (diagnosed in four), autism was assessed for in six children (diagnosed in three), foetal alcohol spectrum disorder (FASD) was assessed for in four children (diagnosed in three), and an assessment of cognitive functioning was

completed for one child and a diagnosis of developmental delay was given. Two families reported that their child received ADHD medication. All parents referred to terms such as "attachment", "attachment difficulties" and "trauma behaviours" being used by various services when seeking support for their child. No parents reported specific assessment for RAD or DSED, or of such discussions having been discussed or taking place.

Key themes

Using RTA, three main themes and six sub-themes were identified through coding and data refinement. These highlight the central role of parents in advocating for holistic understanding across prolonged care journeys and fragmented systems. Partial recognition of children's difficulties and neurodevelopmental labels were described as perceived barriers to such holistic understanding. Finally, parents' experiences of DDP were reported as a contrasting model of care, offering an integrative approach when seeking support for their child that fostered acceptance and confidence.

Theme 1: Struggling to be Heard Within Fragmented Systems

Within parents' accounts, holistic understanding was described as awareness of their children's difficulties as being *"part environment, part genetics"* (P4). Parents did not specifically refer to attachment disorders however they demonstrated their understanding of the importance of holistic perspectives, inclusive of attachment disorders and neurodivergence, across systems, *"It's the adoption. It's the trauma. It's the ADHD. It's all the things that's going on in [child's] head. The way that [child's] brain is wired"* (P1). This was consistent regardless of the child's age at adoption or timing of removal from the maltreatment environment. Early attempts to access

assessment and support were experienced as being limited to isolated aspects of the child's presentation, namely *"just attachment"* (P7), and being further impeded by poorly coordinated pathways and restrictive eligibility criteria. Parents described how this contributed to their experiences of positioning themselves as advocates for holistic understanding for their child and navigating multiple services over time. Although the intensity of these experiences varied, all parents described some degree of fragmentation across services: "*It's frustrating because you are constantly repeating yourself and having to fight. It's like just a constant battle."* (P5).

Subtheme 1.1: Parents Carrying the Interpretative Burden

Isolated service perspectives left parents experiencing *"a huge overwhelming responsibility"* (P5) in recognising, interpreting, and responding to their child's complex needs, whilst balancing differing professional perspectives and explanations, to navigate fragmented systems. While individual professionals were often experienced as knowledgeable within their remit, particularly regarding neurodivergence, parents described opinions as contradictory, tentative, or inconclusive. In the absence of coherent understanding across services, parents felt responsible, but understandably ill-equipped, for integrating information themselves: *"I'm not qualified to be a therapist in any way, shape or form. I'm doing my best, but I needed… I felt like I needed support."* (P5). This interpretative burden was experienced as significant, with parents often seeing themselves as primarily responsible for continuity and support: *"I have to work out what I need, and then I have to ask for it"* (P7).

Subtheme 1.2: Escalating Desperation.

Despite repeated efforts to seek help, parents recounted holistic understanding and support as “*impossible to get.”* (P4), capturing the perceived inaccessibility of services. The absence of integrated support was experienced by parents as contributing to entrenching difficulties across social, emotional and educational domains for children, significant emotional labour for parents and increasing strain on the family system. Parents described being open to *“any kind of help”* (P1) as the emotional toll of prolonged unmet need was experienced as “*getting bigger and bigger and bigger.”* (Parent 1). First-time, or first-time adoptive, parents described this experience as exacerbating internalised blame and self-doubt, intertwined with unconditional love:

> *“I said I've been struggling with [child] since he came to us, and I said, you know, it's taken all this time to get a... to fight for help, and that, it, it has been exhausting, you know, and I will do it and I'll continue to do it for [child] because I love him very much, but it's so hard.”* (P5)

Some parents reported fraught parent-child relationships and fears of placement instability arising from ongoing misunderstanding and lack of whole-child, holistic perspectives. Parents consistently reported wanting to access practical, meaningful support and commonly described pursuing any possible avenue, “*doing anything we could to try and get some support”* (P3). A few parents described turning to self-funded assessments or interventions when system pathways stalled as things were *“just getting a little bit out of hand*” (P1). This reflected both deep commitment and cumulative exhaustion. Within this context, desperation was understood as a rational response to systemic barriers and prolonged unmet need, rather than a lack of resilience.

Subtheme 1.3: Delays to Holistic Care

Even when children presented with significant day-to-day challenges, parents described services often turning them away or unsuccessfully redirecting them. This was commonly experienced in response to parents actively seeking neurodevelopmental assessment. No parents specifically reported RAD or DSED being raised by professionals**,** but some described services focusing on 'attachment' as a general 'catch-all' rather than addressing specific symptoms related to RAD or DSED: *"we'd been told at that time that the neurodiversity wasn't like a thing, and it was all attachment."* (P6). This was especially the case when parents were seeking support in their child's early life. Parents also described being told that a child was too young for meaningful assessment, that their developmental difficulties posed a barrier to assessment and that their difficulties were insufficiently severe to warrant prioritised care. Parents described extended periods during which they attempted to manage risk and complex needs without formal support:

> "*I* was *phoning them [CAMHS] up like every week and going, 'this is a crisis', 'this is a crisis', 'this is a crisis'. You know, like, when are you going to see her? When are you going to see her? You know, like, she's not safe, that's not safe. You know what this is like? Yeah. Our life is, and just her life was, miserable you know, like, she was just really, really miserable."* (P6).

Parents reported that by the time services engaged, difficulties were often more entrenched, and some children had reached crisis points, including significant self-harm.

Theme 2: Recognition Without Resolution

Parents commonly described school, social work and health care services as acknowledging their child’s hyperactivity, emotional dysregulation, disinhibited social approaches, and/or attention difficulties. Yet recognition was rarely experienced as preceding prompt answers or support. In the case of neurodivergence, many parents described “*playing catch-up*” (P9) or experiencing assessment without decisive outcomes:

> *“We've been sat* through *all of these interviews with specialists going, ‘you've definitely got this one’, ‘you've definitely got this one’, ‘can't see how you wouldn't have that’, but then they had this meeting between all three of them and they sat down and went, ‘yeah, I can't really tell’.”* (P1).

In the absence of integrated explanations, parents often described finding their own ways to cope, such as drawing on adoption training or seeking guidance from adoptive parent communities, frequently through social media. Experiences of having to *“just muddle along somehow”* (P6) were described as contributing to the emotional burden parents carried and their sense of systemic frustration. Repeated, inconclusive assessments over extended periods of time were therefore experienced by parents as a diagnostic limbo, where they commonly described *“firefighting”* (P1) to support their child with ongoing and entrenching difficulties. Within parents’ accounts, a holistic understanding therefore extended beyond securing a diagnostic label; it involved seeking an integrated explanation that could meaningfully guide support across contexts, with parents describing a shared hope that “*there has to be something better for people that come after us*” (P5).

Subtheme 2.1: Neurodevelopmental Labels as Gatekeepers to Support

Despite the broader conceptualisation of holistic care, parents experienced that within existing systems, neurodevelopmental diagnoses often functioned as structural gatekeepers to support. Specifically, in the context of limited resolution, parents described continuing to "*push*" (P2) and *"fight"* (P2; P5; P6) for services to understand their child from a holistic perspective, inclusive of neurodevelopmental considerations. This was described by parents collectively as being underpinned by a shared perception that meaningful and practical support, namely in education settings, was contingent on neurodevelopmental diagnoses. Generally, parents described difficulty accessing holistic understandings that included neurodevelopmental perspectives, within systems of care:

> "T*he paediatrician says that all children have sleep difficulties and wouldn't see him, and* the *neurodiverse [pathway] says the only issues are at home, because he's masking really well at school, so they refused him as well."* (P7).

Where children did receive diagnoses of neurodevelopmental differences, parents commonly experienced this as providing clarity, validation and recognition of their child's needs across systems. In terms of support, the most positive outcomes were described by a minority of parents in relation to pharmacological treatment for ADHD with parents describing the change in their child's functioning following medication, compared to pre-treatment experiences, as *"night and day"* (P2). However, most parents described frustrations that earlier neurodevelopmental perspectives may have contributed to better outcomes, *"actually that could have opened up the door to a bit more support for her and probably a bit more understanding from people."* (Parent 6), for children.

Theme 3: Relational Approaches as an Additional Holistic Perspective

Most parents who received Dyadic Developmental Psychotherapy (DDP) described it as a space that could *"incorporate that complete circle"* (P8), including maltreatment, neurodevelopment and relational explanatory frameworks, without prioritising diagnosis over understanding. This approach contrasts with previous experiences of diagnostic-driven services. Many parents noted that early sessions positioning them at the centre of the process were novel, eliciting responses ranging from acceptance to apprehension. Some clinicians were described as incorporating neurodevelopmental and relational considerations into practice, whether or not a formal diagnosis of RAD, DSED or neurodevelopmental differences was in place. Parents generally valued this needs-based approach, describing how it "*aligned largely*" (P4) with their understanding of the child from attachment and neurodevelopmental perspectives. Parents also described experiencing reticence regarding overall outcomes, recognising limitations due to the intervention timescales and the persistence of child behaviours. In contrast, parents randomised to the services-as-usual arm experienced support as *"Nothing*" (P10), "*Nothing, nothing at all"* (P5). These parents described being *"just left"* (P5) to manage their child's difficulties and navigate fragmented systems in the search for holistic consideration, and or support, alone.

Subtheme 3.1: Parental Understanding – A Nuanced but Primary Outcome

Parents reflected that DDP primarily supported their understanding and own regulatory capacity, rather than immediate or observable changes in their child's behaviour:

> *“if someone says something that is important or we've glossed over it without realising or it's a moment, [DDP clinician] backpedals, she stops, she goes into that, and that's a really amazing skill that we're learning, and realising that there's a wealth of information in that and you need to be able to do that* (P9).

This contrasted with parents’ experiences of previous services that were often focused on their child’s behaviour. Parents reported a relational approach which enabled both neurodevelopmental and attachment-related perspectives to be held, describing this as *“reassuring”* (P8). Some parents described this multi-faceted understanding, alongside some practical recommendations, as gradually helping them address, rather than resolve, some of their child’s persistent behaviour through increased understanding, confidence and practical recommendations. Resulting in parents feeling “*closer*” (P1) to their children.

Subtheme 3.2: Tension Between Immediate Needs and Long-Term Change

Parents commonly described a process of acceptance, recognising both the long-term nature of change and the enduring aspects of their child’s behaviour. They spoke about having to *“make the best”* (P6) of their situation and acknowledged that certain difficulties were unlikely to be fully resolved, *“We can't fix her brain, so we need to find ways for us to support her too.”* (P3). A few parents described how the indirect, relational approach of DDP slowed child-focused progress or did not fully address behaviours potentially indicative of RAD, DSED, or neurodevelopmental differences. DDP sessions were often shaped by children’s immediate needs, such as distress regulation or managing inattention. Whilst parents experienced this as contributing to holistic care, some described how this created tension with longer-

term therapeutic goals, "*We got a lot out of it, don't get me wrong, but we could. We could have got more."* (P2). It left some parents questioning whether the approach adequately addressed ongoing child difficulties.

Discussion

This study explored adoptive parents' experiences of holistic approaches in relation to understanding and supporting their child. Emphasis was placed on the extent to which behaviours that may be indicative of RAD, DSED and/or neurodivergence were addressed. Consistent with a realist–essentialist approach, interpretations of the findings represent patterned meanings within parents' accounts, rather than establish objective causal relationships. Overall, findings highlighted parents as central drivers of holistic understanding within systems that frequently understand needs through fragmented diagnostic pathways. These findings are described across themes that conceptualise parents' prolonged journeys towards integrated understanding, the absence of maltreatment-focused assessment and the nuanced but valued role of relational interventions in supporting holistic complexity, as long as child-focused long-term needs are also taken into consideration.

Parents' accounts suggest that, despite early help seeking, services-as-usual systems were perceived as not fully acknowledging both maltreatment and neurodevelopmental perspectives (Hiller et al., 2023). Aligning with some of the literature, parents described early attempts to access support, through usual services, being met with responses framing their child's behaviours as maltreatment and/or 'attachment' with no further exploration of presenting difficulties, or alternative perspectives, such as neurodevelopmental understandings, offered (Allen &

Schuengel, 2020; Cawthorne & Woolgar, 2025; Woolgar & Baldock, 2015). Moreover, parents' experiences indicated that when their advocacy for holistic understanding led to their child undergoing neurodevelopmental assessment, this perspective was often described as taking priority (Berg et al., 2013; Richards, 2013). Parents commonly described delayed access to services (Woolgar et al., 2025) and experiences of repeated inconclusive neurodevelopmental assessment occurring at the expense of considering wider maltreatment-associated presentations (Minnis, 2013). These findings suggest that services were experienced by parents as conceptualising neurodevelopmental and maltreatment-related presentations as competing entities, despite research highlighting the need for a more integrated, holistic approach (Gajwani & Minnis, 2023; Hiller et al., 2023). Within parents' accounts, these patterns were experienced as practical barriers to support, extending the literature by demonstrating how theoretical discourse translates into lived experiences of fragmented care.

A particularly salient finding of the research concerned parents shared perceptions that a neurodevelopmental diagnosis functioned as the gatekeeper to practical supports for their child – especially within education systems. While some parents reported a positive outcome following neurodevelopmental assessment, for many, they were still left looking for more answers and practical support. This is consistent with concerns that relying solely on categorical frameworks may obscure consideration of the interactions between developmental adversity and neurodevelopmental vulnerability (Gajwani & Minnis, 2023; Vereeken et al., 2023). Parents accounts suggest that formulation-based understanding was often delayed in the absence of diagnostic certainty (Woolgar et al., 2025). This echoes Hiller et al.

(2023) concerns regarding current system approaches working to the detriment of children with complex and intersecting difficulties.

The findings also encompassed parents' experiences of confusion and frustration following non-conclusive assessments, which identified overlapping symptoms of multiple neurodevelopmental presentations, but little in the way of understanding or support. This finding suggests that co-occurring or overlapping RAD and/or DSED and/or neurodivergent symptoms/traits, such as attention, social and communication difficulties (Davidson et al., 2022; 2024), may be overlooked in the presence of complexity, despite co-occurrence being proposed as the rule rather than the exception in the context of childhood maltreatment (Minnis, 2013; Zeanah et al., 2016). Experiences of tentative or ambiguous assessment outcomes highlight the frustration and interpretative burden experienced by families when navigating competing professional opinions, fragmented communication and unclear care pathways (Martin et al., 2025; Woolgar et al., 2024). Rather than representing service challenges alone, parental confusion may reflect the complexity described in the literature where overlapping attachment and neurodevelopmental presentations challenge traditional diagnostic boundaries (Gajwani & Minnis, 2023; Hiller at al., 2023). Re-framing tentative outcomes from a holistic and/or synergistic (Vereeken et al., 2023) perspective may be beneficial in understanding potential attachment disorders (Kay et al., 2016; Zilberstein, 2023) and the unique and often complex presentation of neurodevelopmental differences in children with maltreatment histories (Minnis, 2013; Gajwani and Minnis, 2023; Zeanah et al., 2016).

Reductionist approaches were perceived by parents to compound stress for parents and, in some cases, were reported to contribute to fears of placement

instability for parents. Moreover, although not an aim of the current research, parents commonly described their children experiencing increased functional difficulties at home and school, as well as significant emotional distress. Parent reports cannot confirm causal associations between these experiences and poorly coordinated and categorical service response. However, these findings align with trajectories in the literature regarding disproportionately poorer mental health and life outcomes for previously maltreated populations (Gajwani & Minnis, 2023; Sonuga-Barke et al., 2017). Findings therefore suggest that complexity may be amplified not only by early adversity but also by systemic responses that prioritise diagnostic certainty over formulation. Thus, extending Minnis' (2013) proposal that complexity following maltreatment is the norm rather than the exception, illustrates how service structures themselves may exacerbate this complexity.

Aligning with research recommendations (Gajwani & Minnis, 2023; Hiller et al., 2023) parents valued approaches that moved towards relational and formulation-led understandings. Within the context of the RIGHT trial, DDP was frequently described as providing a space in which complexity could be acknowledged and validated. Even where parents felt there was limited child involvement, many reported increased confidence in interacting with their child and reported small improvements in the parent-child relationship. Changes were commonly attributed to parents being more attuned (i.e., emotionally present, aware, and responsive) to their child's needs (Humphreys et al., 2017; Apeiranthitou, 2021; Zeanah & Gleason, 2015) and being able to utilise some practical strategies, such as trauma-informed and neuro-affirming language and environmental adaptations (McCool, 2023; Zilberstein 2023). The findings therefore suggest that relational interventions may operate as spaces for

conceptual integration within otherwise fragmented systems, by focusing on the child-parent attachment, while addressing needs associated with neurodevelopmental differences. This finding starkly contrasts with the experiences of parents receiving services-as-usual during RIGHT, where support was described as non-existent, let alone categorical. These experiences appeared to reinforce frustration, reflecting the views of parents reported in the literature regarding poor service access and communication when seeking mental health support for their children (Martin et al., 2025; Woolgar et al., 2024).

Implications for Practice

This study demonstrates that tensions between attachment disorders *and* neurodevelopmental perspectives are not only reported in the research but are actively enacted within service pathways, shaping families access to understanding and support and carrying important implications for clinical and systemic practice. Foremost, is the need for services and individual professionals to adopt holistic assessment approaches when working with maltreated and adopted children (Cawthorne & Woolgar, 2025; NICE, 2015). Findings should inform cross-service training and consultation models to support colleagues to understand the complex difficulties adopted children often experience (Hiller et al., 2023).

Given the elevated risk of co-occurring neurodevelopmental differences and mental health difficulties in maltreated populations (Dinkler et al., 2017; Gajwani & Minnis, 2023; Jangid et al., 2023; Seim et al., 2022), reliance on parental self-initiation of holistic consideration raises ethical and clinical concerns. Services need to move from a reactive, referral-driven model towards proactive and developmentally

informed holistic assessments, with formulation-led processes embedded across care pathways. Routine consideration of neurodevelopment alongside maltreatment histories and associated problems could support earlier identification of interacting needs and reduce diagnostic overshadowing (NICE, 2015; Hiller et al., 2023). This co-ordinated approach would lessen the emotional toll and advocacy burden experienced by parents, which also contributes to feelings of uncertainty and frustration towards services and professionals (Martin et al., 2025; Woolgar et al., 2024). Such proactive approaches to holistic assessment confer early co-ordinated intervention, which, in turn, may reduce the long-term costs across health, social care and justice systems currently associated with unmet complex needs (Conti et al., 2021; NICE, 2017).

The findings further emphasise the importance of multi-agency systems that move beyond diagnostic silos towards models of shared understanding that are underpinned by trauma- and neurodiverse- informed care (Gajwani & Minnis, 2023; Hiller et al., 2023). Services should consider how organisational practices themselves may support or undermine psychological safety of families accessing services. For example, consistent communication and clearer access pathways would promote trauma- and neurodiverse-informed principles of predictability and transparency to enable collaboration between families, and health, social care and education services (Hiller et al., 2023; Vereeken et al., 2023; Woolgar et al., 2025).

Whilst parents experienced DDP as offering valuable therapeutic spaces for navigating complexity (Hughes et al., 2017) it was not experienced as a standalone solution to address all needs. Rather than reflecting limitations of relational approaches themselves, this appeared to highlight the constraints of delivering such interventions within fragmented systems. As such, clinical practice may benefit from

embedding attachment-focused interventions within broader systemic frameworks that incorporate educational support, environmental adaptations and coordinated multi-disciplinary input (NICE, 2015; McCool, 2023; Zilberstein 2023). The findings highlight that meaningful implementation of holistic care requires structural change that allows flexibility across diagnostic categories and recognises the interconnected nature of CM and neurodevelopment (Gajwani & Minnis, 2023; Hiller et al, 2023).

Methodological Reflections

A key strength of this study was the use of a realist-essentialist approach, which prioritised parents' accounts of their lived experiences while maintaining reflexive awareness of the researcher's interpretative role (Braun & Clarke, 2021). This approach was particularly suited to addressing ecologically grounded research questions focused on service provision and real-world impact (Braun & Clarke, 2006). Many parents who participated in the study explicitly told the researcher that they felt valued by being able to share their experiences and contribute to learning that will support adopted children (Woolgar et al., 2024).

Limitations

Although purposeful sampling enabled recruitment of adoptees with possible symptoms of attachment disorder and neurodevelopmental differences, the sample has inherent bias. These families are likely supporting children with complex mental health difficulties or unmet needs, limiting generalisability to populations with more straightforward or positive service experiences. However, this was partly unavoidable given the study focus on co-occurring symptoms of attachment and neurodevelopmental differences. In addition, families were already engaged in the

RIGHT trial, meaning findings reflect those who had accessed the offered services. Consequently, this still leaves a gap in understanding the experiences of families who, for whatever reasons, are unable to access or engage with services. There were no methodological criteria pertaining to whether families were in the DDP or services-as-usual arm of RIGHT. While this analysis focused on shared experiences across participants, rather than differences between specific service contexts, this may not reflect potential variability in service provision. Diagnostic uncertainty within the sample also warrants consideration.

Screening measures such as the SDQ are not diagnostic tools for neurodevelopmental differences, and it is possible that some presentations reflected developmental adaptations to adversity rather than primary neurodevelopmental differences. Although the RADA provides a robust assessment for RAD or DSED symptoms, the reliance on parent-report only and the absence of observational data may limit diagnostic confidence. These complexities reflect broader, and long-standing clinical challenges in disentangling maltreatment-associated and neurodevelopmental presentations (Davidson et al., 2022; 2024; Wing & Gould, 1979), which is itself consistent with the central findings of this study.

Future Research

The emotive and largely shared experiences reported in this study underscore the value of attending to parents' perspectives, recognising that these accounts provide insight into how services are experienced by families of adopted children. Future research would benefit from including the voices of children and young people themselves to further enrich understanding of holistic care experiences. The findings

highlight a need for evaluative research exploring diagnostic practices, service resource allocation, and their impact on access to support and longer-term outcomes for maltreated and adopted populations. Such work could expand the work of Woolgar et al., (2024) and inform evidence syntheses, similar to Martin et al. (2025), but with a specific focus on adoptive parents' experiences.

Quantitative research examining pathways to accessing holistic care could complement qualitative findings by identifying systemic barriers and facilitators at a population level. Specifically, longitudinal research exploring integrated models of care may support understanding of how maltreatment-associated and neurodevelopmental presentations evolve across developmental trajectories, expanding Soguna-Barke et al's (2017) work. This would also allow for updates to synthesized findings by Bali et al. (2023) and Jangid et al. (2023) to be conducted.

Conclusion

Parents emerged as central facilitators of holistic understanding and key advocates for adopted children while navigating fragmented service systems. Relational approaches, i.e., DDP, were experienced as valuable spaces for validating complexity and supporting family relationships. However, they were frequently positioned as a partial solution within broader systemic gaps, with services-as-usual being described as non-existent, leaving parents feeling alone. Parents described demonstrating considerable resilience and commitment to their children's well-being despite prolonged uncertainty and emotional labour. However, the personal cost of coordinating care within fragmented systems highlights the urgency in developing service models that recognise and respond to the intersecting developmental needs of

children with maltreatment histories, including adoptees (Hiller et al., 2023; Vereeken et al., 2023). Findings highlight the need for systems to assume responsibility for integrating perspectives regarding attachment disorders (RAD and DSED) *and* neurodevelopmental differences, supporting the recommendation that integrated, proactive and formulation-led care pathways should be the standard of care for maltreated and adopted populations (NICE, 2015).

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Appendices

Appendix A

PRISMA 2020 checklist

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. This work is licensed under CC BY 4.0. To view a copy of this license, visit https://creativecommons.org/licenses/by/4.0/

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	6
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	7-8
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	12-14
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	14
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	16-17
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.	17

Section and Topic	Item #	Checklist item	Location where item is reported
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	106-123
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.	16-17
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.	19
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.	19
	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.	19
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.	19
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.	n/a
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	19-20

Section and Topic	Item #	Checklist item	Location where item is reported
		#5)).	
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	19
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	19
	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.	19-20
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	n/a
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	n/a
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	n/a
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	n/a
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.	18; 20-21
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	20
Study characteristics	17	Cite each included study and present its characteristics.	22-23

Section and Topic	Item #	Checklist item	Location where item is reported
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	124-125
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.	27-29
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	20-34
	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.	n/a
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	20-34
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	n/a
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	33-34
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	n/a
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	34-43
	23b	Discuss any limitations of the evidence included in the review.	34-43
	23c	Discuss any limitations of the review processes used.	42
	23d	Discuss implications of the results for practice, policy, and future research.	39-42
OTHER INFORMATION			

Section and Topic	Item #	Checklist item	Location where item is reported
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	15
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	15
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	42
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	6
Competing interests	26	Declare any competing interests of review authors.	6
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.	19

Appendix B

Systematic review search strategy per database

EMBASE (via OvidSP)

1	prevalence/ or cross-sectional studies/ or incidence/ or ((prevalence adj3 rate*) or (incidence adj3 rate*) or (prevalence or incidence or rate*) or ("cross section*" or "cross-sectional")).ti,ab,kw.	8,991,759
2	reactive attachment disorder/ or ((reactive adj3 attachment) or (disinhibit* adj3 attachment) or (disinhibit* adj3 social adj3 engagement) or (reactive adj3 social adj3 engagement) or "reactive attachment disorder" or rad or "disinhibited social engagement disorder" or dsed or "disinhibited reactive attachment disorder" or "d-rad" or drad).ti,ab,kw.	25,991
3	autism/ or (autis* or (autism adj3 spectrum) or "autism spectrum disorder*" or asd* or (pervasive adj3 development*) or "pervasive development* disorder*" or pdd* or Asperger*).ti,ab,kw.	171,955
4	attention deficit hyperactivity disorder/ or (adhd or addh or adhs or "add" or (ad adj hd) or (attention* adj3 (defic* or dysfunc* or disorder*)) or ((impulsiv* or inattentiv* or inattention*) adj3 (defic* or dysfunc* or disorder*)) or (hyperactiv* adj3 (defic* or dysfunc* or disorder*))).ti,ab,kw.	267,425
5	learning disorder/ or intellectual impairment/ or developmental disabilities/ or developmental disorder/ or (((development* or learning or intellectual) adj3 (defic* or disorder* or disabilit* or delay*)) or "neurodevelop* disorder*" or "global developmental delay" or ld or id or gdd).ti,ab,kw.	1,304.544
6	developmental coordination disorder/ or psychomotor disorders/ or ("developmental coordination disorder*" or (developmental adj3 coordination) or dcd or dyspraxi*).ti,ab,kw.	20,210
7	developmental language disorder/ or language disability/ or speech disorder/ or ((developmental adj3 language adj3 disorder*) or "developmental language disorder*" or (language adj3 disabilit*) or (specific adj3 language adj3 (disabilit* or disorder*)) or sld or "speech and language impairment*" or (speech adj3 disorder*) or dld).ti,ab,kw.	68,218

8	tic/ or stereotypic movement disorder/ or Gilles de la Tourette syndrome/ or ("tic disorder*" or tics or "stereotypic movement disorder*" or tourette* or "tourette's syndrome*").ti,ab,kw.	24,558
9	adoption/ or adopted child/ or (adoption or "adopted child*" or adopt* or institutionali* or orphan*).ti,ab,kw.	610,348
10	english.la	43,866,565
11	2 or 3 or 4 or 5 or 6 or 7 or 8	1,758,258
12	1 and 9 and 10 and 11	8,672

MEDLINE (via OvidSP)

1	prevalence/ or cross-sectional/ or incidence/ or (prevalence or incidence or rate* or "cross section*" or "cross-sectional").ti,ab,kw.	6,072,730
2	adoption/ or ("adopted child*" or adopt* or institutionali* or orphan*).ti,ab,kw.	476,260
3	reactive attachment disorder/ or ((reactive adj3 attachment) or (disinhibit* adj3 attachment) or (disinhibit* adj3 social adj3 engagement) or (reactive adj3 social adj3 engagement) or "reactive attachment disorder" or rad or "disinhibited social engagement disorder" or dsed or "disinhibited reactive attachment disorder" or "d-rad" or drad).ti,ab,kw.	14,662
4	Autistic Disorder/ or (autis* or (autism adj3 spectrum) or "autism spectrum disorder*" or asd* or (pervasive adj3 development*) or "pervasive development* disorder*" or pdd* or Asperger*).ti,ab,kw.	109,589
5	Attention Deficit Disorder with Hyperactivity/ or (adhd or addh or adhs or "add" or (ad adj hd) or (attention* adj3 (defic* or dysfunc* or disorder*)) or ((impulsiv* or inattentiv* or inattention*) adj3 (defic* or dysfunc* or disorder*)) or (hyperactiv* adj3 (defic* or dysfunc* or disorder*))).ti,ab,kw.	165,978
6	Neurodevelopmental disorders/ or Learning disability/ or Intellectual disability/ or Developmental disabilities/ or (((development* or learning or intellectual) adj3 (defic* or disorder* or disabilit* or delay*)) or "neurodevelop* disorder*" or "global developmental delay" or ld or id or gdd).ti,ab,kw	915,897
7	Motor skills disorders/ or psychomotor disorders/ or ("developmental coordination disorder*" or	13,376

	(developmental adj3 coordination) or dcd or dyspraxi*).ti,ab,kw.	
8	Language Development Disorders/ or Speech disorders/ or Language disorders/ or ((developmental adj3 language adj3 disorder*) or "developmental language disorder*" or (language adj3 disabilit*) or (specific adj3 language adj3 disabilit*) or sld or "speech and language impairment*" or (speech adj3 disorder*) or dld).ti,ab,kw.	34,453
9	Tics/ or Tic disorders/ or Tourette syndrome/ or ("tic disorder*" or tics or "stereotypic movement disorder*" or tourette* or "tourette's syndrome*").ti,ab,kw.	11,855
10	english.la	35,213,040
11	2 or 3 or 4 or 5 or 6 or 7 or 8	1,195,316
12	1 and 2 and 10 and 11	4663

PsychINFO (via EBSCOhost)

S12	S1 AND S2 AND S10 AND S11	1,439
S11	S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR 29	45,310
S10	LA(English)	1,209,966
S9	DE "Tic Disorders" or DE "Tics" or DE "Tourette Syndrome" OR TI("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*") OR AB("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*") or KW("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*")	1,063
S8	DE "Developmental Coordination Disorder" OR TI(("developmental coordination disorder*") OR (developmental N3 coordination) OR dcd OR (dyspraxi*)) OR AB("developmental coordination disorder*") OR AB((developmental N3 coordination) OR dcdOR (dyspraxi*)) or KW((developmental N3 coordination) OR dcdOR (dyspraxi*))	233
S7	DE "Specific Language Impairment" or DE "Speech Disorders" OR TI((developmental N3 language N3 disorder*) OR "developmental language disorder*" OR (language N3 disabilit*) OR (specific N3 language N3 (disabilit* or disorder) OR sld OR "speech and language impairment*" OR (speech N3 disorder*) OR dld) OR AB((developmental N3 language N3 disorder*) OR "developmental language disorder*" OR (language N3 disabilit*) OR (specific N3 language N3 disabilit*) OR sld OR "speech and language impairment*" OR (speech N3	2,578

	disorder*) OR dld) OR KW((developmental N3 language N3 disorder*) OR "developmental language disorder*" OR (language N3 disabilit*) OR (specific N3 language N3 disabilit*) OR sld OR "speech and language impairment*" OR (speech N3 disorder*) OR dld)	
S6	DE "Neurodiversity" or DE "Neurodevelopmental Disorders" or DE "Developmental Disabilities" or DE "Intellectual Development" or DE "Delayed Development" or DE "Intellectual Development Disorder" or DE "Learning Disorders" OR TI(((development* OR learning OR intellectual) N3 (defic* OR disorder* OR disabilit* OR delay*)) OR "neurodevelop* disorder*" OR "global developmental delay" OR ld OR id OR gdd) or AB(((development* OR learning OR intellectual) N3 (defic* OR disorder* OR disabilit* OR delay*)) OR "neurodevelop* disorder*" OR "global developmental delay" OR ld OR id OR gdd)or KW(((development* OR learning OR intellectual) N3 (defic* OR disorder* OR disabilit* OR delay*)) OR "neurodevelop* disorder*" OR "global developmental delay" OR ld OR id OR gdd)	19,919
S5	DE "Attention Deficit Disorder" or DE "Attention Deficit Disorder with Hyperactivity" OR TI(adhd OR addh OR adhs OR "add" OR (ad N3 hd) OR (attention* N3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) N3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* N3 (defic* OR dysfunc* OR disorder*))) OR AB(adhd OR addh OR adhs OR "add" OR (ad N3 hd) OR (attention* N3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) N3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* N3 (defic* OR dysfunc* OR disorder*))) or KW(adhd OR addh OR adhs OR "add" OR (ad N3 hd) OR (attention* N3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) N3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* N3 (defic* OR dysfunc* OR disorder*))))	12,509
S4	DE "Autistic Traits" or DE "Autism Spectrum Disorders" OR TI(autis* OR (autism N3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive N3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*) OR AB(autis* OR (autism N3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive N3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*) or KW(autis* OR (autism N3 spectrum) OR "autism spectrum	16,105

S3	disorder*" OR asd* OR (pervasive N3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*)) DE"Attachment isorders" OR TI(reactive N3 attachment) OR (disinhibit* N3 attachment) OR (disinhibit* N3 social N3 engagement) OR (reactive N3 social N3 engagement) OR ("reactive attachment disorder") OR rad OR "disinhibited social engagement disorder" OR "dsed" OR disinhibited reactive attachment disorder" or "d-rad" OR "drad") or AB(reactive N3 attachment) OR (disinhibit* N3 attachment) OR (disinhibit* N3 social N3 engagement) OR (reactive N3 social N3 engagement) OR ("reactive attachment disorder") OR rad OR "disinhibited social engagement disorder" OR "dsed" OR disinhibited reactive attachment disorder" or "d-rad" OR "drad") or KW(reactive N3 attachment) OR (disinhibit* N3 attachment) OR (disinhibit* N3 social N3 engagement) OR (reactive N3 social N3 engagement) OR ("reactive attachment disorder") OR rad OR "disinhibited social engagement disorder" OR "dsed" OR disinhibited reactive attachment disorder" or "d-rad" OR "drad")	287
S2	DE "Adoptees" or DE "Adoption (Child)" or DE "International Adoption" OR TI(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*) OR AB(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*)) OR KW(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*)	21,715
S1	DE prevalence or DE incidence or DE epidemiology or DE cross sectional study OR TI ((prevalence adj3 rate*) or (incidence N3 rate*) or (prevalence or incidence or rate*) or ("cross section*" or "cross-sectional")) OR AB((prevalence adj3 rate*) or (incidence N3 rate*) or (prevalence or incidence or rate*) or ("cross section*" or "cross-sectional")) or KW((prevalence adj3 rate*) or (incidence N3 rate*) or (prevalence or incidence or rate*) or ("cross section*" or "cross-sectional"))	105,480

CINHAL (via EBSCOhost)

S12	S1 AND S2 AND S10 AND S11	14
S11	S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9	77,526
S10	LA english	9,247,495
S9	(MH "Tic") or (MH "Tourette Syndrome") OR ("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*").ti,ab.	1,836

S8	(MH "Specific Language Impairment") or (MH "Language Disorders") OR ((developmental N3 language N3 disorder*) OR "developmental language disorder*" OR (language N3 disabilit*) OR (specific N3 language N3 (disabilit* or disorder)) OR sld OR "speech and language impairment*" OR (speech N3 disorder*) OR dld).ti,ab.	7,288
S7	(MH motor skills disorders) OR (("developmental coordination disorder*" OR (developmental N3 coordination) OR dcd OR dyspraxi*).ti,ab.	3,260
S6	(MH "Neurodevelopment") or (MH "Neurodiversity") or (MH "Developmental Disabilities") or (MH "Intellectual Disability") or (MH "Learning Disorders") OR (((development* or learning or intellectual) N3 (defic* or disorder* or disabilit* OR delay*)) or "neurodevelop* disorder*" or "global developmental delay" or "ld" or "id" or "gdd").ti,ab.	45,597
S5	MH "attention deficit hyperactivity disorder" OR (adhd OR addh OR adhs OR "add" OR (ad N3 hd) OR (attention* N3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) N3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* N3 (defic* OR dysfunc* OR disorder*))).ti,ab.	21,013
S4	(MH "Child Development Disorders, Pervasive") or (MH "Autism Spectrum Disorder") or (MH "Asperger Syndrome") OR ((autis* OR (autism N3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive N3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*).ti,ab.	1,913
S3	(MH "Reactive Attachment Disorder") OR ((reactive N3 attachment) OR (disinhibit* N3 attachment) OR (disinhibit* N3 social N3 engagement) OR (reactive N3 social N3 engagement) OR "reactive attachment disorder" OR rad OR "disinhibited social engagement disorder" OR dsed OR "disinhibited reactive attachment disorder" OR "d-rad" OR drad).ti,ab.	290
S2	(MH "Adoption") or (MH "Child, Adopted") or (MH "Child, Institutionalized") or (MH "Orphans and Orphanages") OR ((adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*).ti,ab.	5,955
S1	(MH "Prevalence") or (MH "Cross Sectional Studies") OR ((prevalence N3 rate*) OR (incidence N3 rate*) OR prevalence	388,326

	OR incidence OR rate* OR "cross section*" OR "cross-sectional").ti,ab.	

Child Development and Adolescent Studies (via EBSCOhost)

S12	S1 AND S2 AND S10 AN S11	136
S11	S3 OR S4 OR S5 OR S6 MOR S7 OR S8 OR S9	49,620
S10	LA(English)	1,209,966
S9	SU(tic disorders) OR SU(tourette syndrome) OR (TI("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*") OR AB("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*"))	1,050
S8	(TI("developmental coordination disorder*") OR TI(developmental N3 coordination) OR TI(dcd) OR TI(dyspraxi*) OR AB("developmental coordination disorder*") OR AB(developmental N3 coordination) OR AB(dcd) OR AB(dyspraxi*))	289
S7	SU(language disorders) OR TI(developmental N3 language N3 disorder*) OR "developmental language disorder*" OR (language N3 disabilit*) OR (specific N3 language N3 disabilit*) OR sld OR "speech and language impairment*" OR (speech N3 disorder*) OR dld) or AB(developmental N3 language N3 disorder*) OR "developmental language disorder*" OR (language N3 disabilit*) OR (specific N3 language N3 disabilit*) OR sld OR "speech and language impairment*" OR (speech N3 disorder*) OR dld)	3,350
S6	SU(developmental disabilities) OR SU(learning disabilities) OR (TI((development* OR learning OR intellectual) N3 (defic* OR disorder* OR disabilit* or delay*) OR TI("neurodevelop* disorder*") OR TI("global developmental delay") OR TI(ld) OR TI(id) OR TI(gdd) OR AB((development* OR learning OR intellectual) N3 (defic* OR disorder* OR disabilit* or delay*) OR AB("neurodevelop* disorder*") OR AB("global developmental delay") OR AB(ld) OR AB(id) OR AB(gdd))	21,394
S5	SU(attention) OR (TI(adhd OR addh OR adhs OR "add" OR (ad N3 hd) OR (attention* N3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) N3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* N3 (defic* OR dysfunc* OR disorder*))) OR AB(adhd OR addh OR adhs OR "add" OR (ad N3 hd) OR (attention* N3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR	15,451

	inattention*) N3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* N3 (defic* OR dysfunc* OR disorder*))))	
S4	SU(autism) OR (TI(autis* OR (autism N3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive N3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*) OR AB(autis* OR (autism N3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive N3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*))	16,160
S3	TI(reactive N3 attachment) OR AB(reactive N3 attachment) OR TI(disinhibit* N3 attachment) OR AB(disinhibit* N3 attachment) OR TI(disinhibit* N3 social N3 engagement) OR AB(disinhibit* N3 social N3 engagement) OR TI(reactive N3 social N3 engagement) OR AB(reactive N3 social N3 engagement) OR TI("reactive attachment disorder") OR AB("reactive attachment disorder") OR TI(rad) OR AB(rad) OR TI("disinhibited social engagement disorder") OR AB("disinhibited social engagement disorder") OR TI(dsed) OR AB(dsed) OR TI("disinhibited reactive attachment disorder") OR AB("disinhibited reactive attachment disorder") OR TI("d-rad") OR AB("d-rad") OR TI(drad) OR AB(drad)	238
S2	SU(adoptees) OR SU(adoption) OR SU(adopted children) OR (TI(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*) OR AB(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*))	21,811
S1	TI ((prevalence N3 rate*) OR (incidence N3 rate*) OR (prevalence OR incidence OR occurrence* OR rate* OR frequency) OR ("cross section*" OR "cross-sectional")) OR AB ((prevalence N3 rate*) OR (incidence N3 rate*) OR (prevalence OR incidence OR occurrence* OR rate* OR frequency) OR ("cross section*" OR "cross-sectional"))	86,790

Psychology and Behavioural Sciences Collection (via EBSCOhost)

S12	S1 AND S2 AND S10 AND S11	244
S11	S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9	72,938
S10	LA(English)	1,576,420
S9	SU("tic disorders") OR SU("tourette syndrome") OR TI("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*") OR AB("tic	1,304

	disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*")	
S8	SU("language disorders") OR TI("developmental N3 language N3 disorder*" OR "developmental language disorder*" OR "language N3 disabilit*" OR "specific N3 language N3 disabilit*" OR "specific N3 language N3 disorder*" OR sld OR "speech and language impairment*" OR "speech N3 disorder*" OR dld) OR AB("developmental N3 language N3 disorder*" OR "developmental language disorder*" OR "language N3 disabilit*" OR "specific N3 language N3 disabilit*" OR "specific N3 language N3 disorder*" OR sld OR "speech and language impairment*" OR "speech N3 disorder*" OR dld)	1,744
S7	(TI("developmental coordination disorder*") OR TI(developmental N3 coordination) OR TI(dcd) OR TI(dyspraxi*) OR AB("developmental coordination disorder*") OR AB(developmental N3 coordination) OR AB(dcd) OR AB(dyspraxi*))	409
S6	SU("learning disabilities") OR SU("intellectual disabilities") OR SU("developmental disabilities") OR TI((development* OR learning OR intellectual) N3 (defic* OR disorder* OR disabilit* or delay*) OR TI("neurodevelop* disorder*") OR TI("global developmental delay") OR TI(ld) OR TI(id) OR TI(gdd) OR AB((development* OR learning OR intellectual) N3 (defic* OR disorder* OR disabilit* or delay*) OR AB("neurodevelop* disorder*") OR AB("global developmental delay") OR AB(ld) OR AB(id) OR AB(gdd)	34,950
S5	SU(attention) OR (TI(adhd OR addh OR adhs OR "add" OR (ad N3 hd) OR (attention* N3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) N3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* N3 (defic* OR dysfunc* OR disorder*))) OR AB(adhd OR addh OR adhs OR "add" OR (ad N3 hd) OR (attention* N3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) N3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* N3 (defic* OR dysfunc* OR disorder*))))	24,654
S4	SU(autism) OR TI(autis* OR (autism N3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive N3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*) OR AB(autis* OR (autism N3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive N3	20,665

	development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*)	
S3	TI(reactive N3 attachment) OR AB(reactive N3 attachment) OR TI(disinhibit* N3 attachment) OR AB(disinhibit* N3 attachment) OR TI(disinhibit* N3 social N3 engagement) OR AB(disinhibit* N3 social N3 engagement) OR TI(reactive N3 social N3 engagement) OR AB(reactive N3 social N3 engagement) OR TI("reactive attachment disorder") OR AB("reactive attachment disorder") OR TI(rad) OR AB(rad) OR TI("disinhibited social engagement disorder") OR AB("disinhibited social engagement disorder") OR TI(dsed) OR AB(dsed) OR TI("disinhibited reactive attachment disorder") OR AB("disinhibited reactive attachment disorder") OR TI("d-rad") OR AB("d-rad") OR TI(drad) OR AB(drad)	280
S2	SU(adoptees) OR SU("adopted children") OR TI(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*) OR AB(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*)	24,960
S1	TI ("prevalence N3 rate*" OR "incidence N3 rate*" OR prevalence OR incidence OR rate* OR "cross section*" OR "cross-sectional" OR AB "prevalence N3 rate*" OR "incidence N3 rate*" OR prevalence OR incidence OR rate* OR "cross section*" OR "cross-sectional"	171,051

Applied Social Science Index and Abstracts (via ProQuest)

S12	[S1] AND [S2] AND [S10] AND [S11]	794
S11	[S3] OR [S4] OR [S5] OR [S6] OR [S7] OR [S8] OR [S9]	125,823
S10	LA(English)	5,282,985
S9	MAINSUBJECT.EXACT("Movement disorders") or MAINSUBJECT.EXACT("Tourette's syndrome") OR TI("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*") OR AB("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*") of IF("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*")	1,234
S8	MAINSUBJECT.EXACT("Dyspraxia") OR MAINSUBJECT.EXACT("Developmental coordination disorder") OR TI(("developmental coordination disorder*") OR (developmental N3 coordination) OR dcd	5221

	OR dyspraxi*) OR AB(("developmental coordination disorder*") OR (developmental N3 coordination) OR dcd OR dyspraxi*) or IF(("developmental coordination disorder*") OR (developmental N3 coordination) OR dcd OR dyspraxi*)	
S7	MAINSUBJECT.EXACT("Specific language impairment") OR TI((developmental N3 language N3 disorder*) OR "developmental language disorder*" OR (language N3 disabilit*) OR (specific N3 language N3 (disabilit* or disorder)) OR sld OR "speech and language impairment*" OR (speech N3 disorder*) OR dld) or AB((developmental N3 language N3 disorder*) OR "developmental language disorder*" OR (language N3 disabilit*) OR (specific N3 language N3 (disabilit* or disorder)) OR sld OR "speech and language impairment*" OR (speech N3 disorder*) OR dld) or IF((developmental N3 language N3 disorder*) OR "developmental language disorder*" OR (language N3 disabilit*) OR (specific N3 language N3 (disabilit* or disorder)) OR sld OR "speech and language impairment*" OR (speech N3 disorder*) OR dld)	1,451
S6	MAINSUBJECT.EXACT("Neurodevelopmental disorders") OR MAINSUBJECT.EXACT("Developmental disorders") OR MAINSUBJECT.EXACT("Intellectual disabilities") OR MAINSUBJECT.EXACT("Learning disabilities") OR TI((development* OR learning OR intellectual) NEAR/3 (defic* OR disorder* OR disabilit* or delay*) OR "neurodevelop* disorder*" OR "global developmental delay" OR ld OR id OR gdd) or AB((development* OR learning OR intellectual) NEAR/3 (defic* OR disorder* OR disabilit* or delay*) OR "neurodevelop* disorder*" OR "global developmental delay" OR ld OR id OR gdd) or IF((development* OR learning OR intellectual) NEAR/3 (defic* OR disorder* OR disabilit* or delay*) OR "neurodevelop* disorder*" OR "global developmental delay" OR ld OR id OR gdd)	49,314
S5	MAINSUBJECT.EXACT("Attention deficit hyperactivity disorder") OR TI(adhd OR addh OR adhs OR "add" OR (ad NEAR/3 hd) OR (attention* NEAR/3 (defic* OR dysfunc* OR disorder*))OR ((impulsiv* OR inattentiv* OR inattention*) NEAR/3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* NEAR/3 (defic* OR dysfunc* OR	57,590

	disorder*))) OR AB(adhd OR addh OR adhs OR "add" OR (ad NEAR/3 hd) OR (attention* NEAR/3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) NEAR/3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* NEAR/3 (defic* OR dysfunc* OR disorder*))) OR IF(adhd OR addh OR adhs OR "add" OR (ad NEAR/3 hd) OR (attention* NEAR/3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) NEAR/3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* NEAR/3 (defic* OR dysfunc* OR disorder*)))	
S4	MAINSUBJECT.EXACT ("Autism") or MAINSUBJECT.EXACT ("Asperger's syndrome") or TI(autis* OR (autism NEAR/3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive NEAR/3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*) or AB(autis* OR (autism NEAR/3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive NEAR/3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*) or If(autis* OR (autism NEAR/3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive NEAR/3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*)	20,622
S3	MAINSUBJECT.EXACT ("Attachment disorders") or TI(reactive NEAR/3 attachment OR disinhibit* NEAR/3 attachment OR disinhibit* NEAR/3 social NEAR/3 engagement OR reactive NEAR/3 social NEAR/3 engagement OR "reactive attachment disorder" OR rad OR "disinhibited social engagement disorder" OR dsed OR "disinhibited reactive attachment disorder" OR "d-rad" OR drad) or AB(reactive NEAR/3 attachment OR disinhibit* NEAR/3 attachment OR disinhibit* NEAR/3 social NEAR/3 engagement OR reactive NEAR/3 social NEAR/3 engagement OR "reactive attachment disorder" OR rad OR "disinhibited social engagement disorder" OR dsed OR "disinhibited reactive attachment disorder" OR "d-rad" OR drad) or IF(reactive NEAR/3 attachment OR disinhibit* NEAR/3 attachment OR disinhibit* NEAR/3 social NEAR/3 engagement OR reactive NEAR/3 social NEAR/3 engagement OR "reactive attachment disorder" OR rad OR "disinhibited social engagement disorder" OR	3,417

	dsed OR "disinhibited reactive attachment disorder" OR "d-rad" OR drad)	
S2	MAINSUBJECT.EXACT("Adopted children") OR MAINSUBJECT.EXACT("Orphanages") or MAINSUBJECT.EXACT("Intercountry adoption") AND MAINSUBJECT.EXACT("Adoption") OR TI(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*) OR AB(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*) OR IF(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*)	278,574
S1	MAINSUBJECT.EXACT ("Cross-sectional studies") OR MAINSUBJECT.EXACT ("Prevalence" OR "Incidence") OR TI(prevalence NEAR/3 rate* OR incidence NEAR/3 rate* OR prevalence OR incidence OR rate* OR "cross section*" OR "cross-sectional") OR AB(prevalence NEAR/3 rate* OR incidence NEAR/3 rate* OR prevalence OR incidence OR rate* OR "cross section*" OR "cross-sectional") OR IF(prevalence NEAR/3 rate* OR incidence NEAR/3 rate* OR prevalence OR incidence OR rate* OR "cross section*" OR "cross-sectional")	830,510

Web of Science Core Collection

12	#11 AND #10 AND #2 and English (Languages)	3,236
11	#11 AND #10 AND #2 AND #1	3,347
10	#3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9	873,351
9	TI=("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette* syndrome*") OR AB=("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette* syndrome*") or AK=("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette* snndrome*")	43,579
8	TI=((developmental NEAR/3 language NEAR/3 disorder*) OR "developmental language disorder*" OR (language NEAR/3 disabilit*) OR (specific NEAR/3 language NEAR/3 (disabilit* OR disorder*)) OR sld OR "speech and language impairment*" OR (speech NEAR/3 disorder*) OR dld) or AB=((developmental NEAR/3 language NEAR/3 disorder*) OR "developmental language disorder*" OR (language NEAR/3 disabilit*) OR (specific NEAR/3 language	21,278

	NEAR/3 (disabilit* OR disorder*)) OR sld OR "speech and language impairment*" OR (speech NEAR/3 disorder*) OR dld) or AK=((developmental NEAR/3 language NEAR/3 disorder*) OR "developmental language disorder*" OR (language NEAR/3 disabilit*) OR (specific NEAR/3 language NEAR/3 (disabilit* OR disorder*)) OR sld OR "speech and language impairment*" OR (speech NEAR/3 disorder*) OR dld)	
7	TI=("developmental coordination disorder*" OR (developmental NEAR/3 coordination) OR "dcd" OR dyspraxi*) OR AB=("developmental coordination disorder*" OR (developmental NEAR/3 coordination) OR "dcd" OR dyspraxi*) or AK=("developmental coordination disorder*" OR (developmental NEAR/3 coordination) OR "dcd" OR dyspraxi*)	9,643
6	TI=((development* OR learning OR intellectual) NEAR/3 (defic* OR disorder* OR disabilit* OR delay*) OR "neurodevelop* disorder*" OR "global developmental delay" OR ld OR id OR gdd) OR AB=((development* OR learning OR intellectual) NEAR/3 (defic* OR disorder* OR disabilit* OR delay*) OR "neurodevelop* disorder*" OR "global developmental delay" OR ld OR id OR gdd) or AK=((development* OR learning OR intellectual) NEAR/3 (defic* OR disorder* OR disabilit* OR delay*) OR "neurodevelop* disorder*" OR "global developmental delay" OR ld OR id OR gdd)	370,984
5	TI=(adhd OR "add" OR "adhs" OR (ad NEAR/3 hd) OR (attention* NEAR/3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) NEAR/3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* NEAR/3 (defic* OR dysfunc* OR disorder*))) OR AB=(adhd OR "add" OR "adhs" OR (ad NEAR/3 hd) OR (attention* NEAR/3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) NEAR/3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* NEAR/3 (defic* OR dysfunc* OR disorder*))) or AK=(adhd OR "add" OR "adhs" OR (ad NEAR/3 hd) OR (attention* NEAR/3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) NEAR/3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* NEAR/3 (defic* OR dysfunc* OR disorder*)))	301,173

4	TI=(autis* OR (autism NEAR/3 spectrum) OR (autism spectrum disorder*) OR asd* OR (pervasive NEAR/3 development*) OR (pervasive NEAR/3 development* NEAR/3 disorder*) OR pdd* OR Asperger*) OR AB=(autis* OR (autism NEAR/3 spectrum) OR (autism spectrum disorder*) OR asd* OR (pervasive NEAR/3 development*) OR (pervasive NEAR/3 development* NEAR/3 disorder*) OR pdd* OR Asperger*) or AK=(autis* OR (autism NEAR/3 spectrum) OR (autism spectrum disorder*) OR asd* OR (pervasive NEAR/3 development*) OR (pervasive NEAR/3 development* NEAR/3 disorder*) OR pdd* OR Asperger*)	157,281
3	TI=((reactive NEAR/3 attachment) OR (disinhibit* NEAR/3 attachment) OR (disinhibit* NEAR/3 (social NEAR/3 engagement)) OR (reactive NEAR/3 (social NEAR/3 engagement)) OR "reactive attachment disorder" OR "rad" OR "disinhibited social engagement disorder" OR "dsed" OR "disinhibited reactive attachment disorder" OR "d-rad" OR "drad") OR AB=((reactive NEAR/3 attachment) OR (disinhibit* NEAR/3 attachment) OR (disinhibit* NEAR/3 (social NEAR/3 engagement)) OR (reactive NEAR/3 (social NEAR/3 engagement)) OR "reactive attachment disorder" OR "rad" OR "disinhibited social engagement disorder" OR "dsed" OR "disinhibited reactive attachment disorder" OR "d-rad" OR "drad") OR AK=((reactive NEAR/3 attachment) OR (disinhibit* NEAR/3 attachment) OR (disinhibit* NEAR/3 (social NEAR/3 engagement)) OR (reactive NEAR/3 (social NEAR/3 engagement)) OR "reactive attachment disorder" OR "rad" OR "disinhibited social engagement disorder" OR "dsed" OR "disinhibited reactive attachment disorder" OR "d-rad" OR "drad")	31,971
2	TI=(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*) OR AB=(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*) or AK=(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*)	1,590,102
1	TI=(prevalence OR incidence OR rate* OR "cross section*" OR "cross-sectional") OR AB=(prevalence OR incidence OR rate* OR "cross section*" OR "cross-	9,875,397

sectional") OR AK=(prevalence OR incidence OR rate* OR "cross section*" OR "cross-sectional")

ProQuest Dissertations and Theses – Grey Literature Search

S13	[S12] AND [S13]	729
S12	LA(English)	5,282,985
S11	[S1] AND [S2] AND [S10]	1,002
S10	[S3] OR [S4] OR [S5] OR [S6] OR [S7] OR [S8] OR [S9]	121,060
S9	SU.EXACT("movement disorders") OR SU.EXACT("tourette syndrome") OR (TI("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*") OR AB("tic disorder*" OR tics OR "stereotypic movement disorder*" OR tourette* OR "tourette's syndrome*"))	5,075
S8	SU.EXACT("developmental coordination disorder") OR TI("developmental coordination disorder*") OR TI(developmental NEAR/3 coordination) OR TI(dcd) OR TI(dyspraxi*) OR AB("developmental coordination disorder*") OR AB(developmental NEAR/3 coordination) OR AB(dcd) OR AB(dyspraxi*)	582
S7	SU.EXACT("language disorders") OR SU.EXACT("Specific Language Disability") OR TI((developmental NEAR/3 language NEAR/3 disorder*) OR "developmental language disorder*" OR (language NEAR/3 disabilit*) OR (specific NEAR/3 language NEAR/3 (disabilit* OR disorder)) OR sld OR "speech and language impairment*" OR (speech NEAR/3 disorder*) OR dld) OR AB((developmental NEAR/3 language NEAR/3 disorder*) OR "developmental language disorder*" OR (language NEAR/3 disabilit*) OR (specific NEAR/3 language NEAR/3 (disabilit* OR disorder)) OR sld OR "speech and language impairment*" OR (speech NEAR/3 disorder*) OR dld)	3,624
S6	SU.EXACT("neurodevelopmental disorders") OR SU.EXACT("developmental disabilities") OR SU.EXACT("intellectual disability") OR SU.EXACT("mild intellectual disability") OR SU.EXACT("moderate intellectual disability") OR SU.EXACT("severe intellectual disability") OR SU.EXACT("developmental delays") OR TI((development* OR learning OR intellectual) NEAR/3 (defic* OR disorder* OR disabilit* OR delay*)) OR	42,202

	TI("neurodevelop* disorder*") OR TI("global developmental delay") OR TI(ld) OR TI(id) OR TI(gdd) OR AB((development* OR learning OR intellectual) NEAR/3 (defic* OR disorder* OR disabilit* OR delay*)) OR AB("neurodevelop* disorder*") OR AB("global developmental delay") OR AB(ld) OR AB(id) OR AB(gdd)	
S5	SU.EXACT("attention deficit hyperactivity disorder") OR TI(adhd OR addh OR adhs OR "add" OR (ad NEAR/3 hd) OR (attention* NEAR/3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) NEAR/3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* NEAR/3 (defic* OR dysfunc* OR disorder*))) OR AB(adhd OR addh OR adhs OR "add" OR (ad NEAR/3 hd) OR (attention* NEAR/3 (defic* OR dysfunc* OR disorder*)) OR ((impulsiv* OR inattentiv* OR inattention*) NEAR/3 (defic* OR dysfunc* OR disorder*)) OR (hyperactiv* NEAR/3 (defic* OR dysfunc* OR disorder*)))	57,489
S4	SU.EXACT("autism spectrum disorders") OR SU.EXACT("autism") OR TI(autis* OR (autism NEAR/3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive NEAR/3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*) OR AB(autis* OR (autism NEAR/3 spectrum) OR "autism spectrum disorder*" OR asd* OR (pervasive NEAR/3 development*) OR "pervasive development* disorder*" OR pdd* OR Asperger*)	21,263
S3	SU.EXACT("attachment disorders") OR TI(reactive NEAR/3 attachment) OR AB(reactive NEAR/3 attachment) OR TI(disinhibit* NEAR/3 attachment) OR AB(disinhibit* NEAR/3 attachment) OR TI(disinhibit* NEAR/3 social NEAR/3 engagement) OR AB(disinhibit* NEAR/3 social NEAR/3 engagement) OR TI(reactive NEAR/3 social NEAR/3 engagement) OR AB(reactive NEAR/3 social NEAR/3 engagement) OR TI("reactive attachment disorder") OR AB("reactive attachment disorder") OR TI(rad) OR AB(rad) OR TI("disinhibited social engagement disorder") OR AB("disinhibited social engagement disorder") OR TI(dsed) OR AB(dsed) OR TI("disinhibited reactive attachment disorder") OR	3,397

	AB("disinhibited reactive attachment disorder") OR TI("d-rad") OR AB("d-rad") OR TI(drad) OR AB(drad)	
S2	SU.EXACT("adoption") OR (TI(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*) OR AB(adoption OR "adopted child*" OR adopt* OR institutionali* OR orphan*))	278,221
S1	(SU.EXACT("Cross-sectional studies") OR SU.EXACT("Prevalence") OR SU.EXACT("Incidence")) OR (TI(("prevalence" NEAR/3 "rate*") OR ("incidence" NEAR/3 "rate*") OR "prevalence" OR "incidence" OR rate* OR "cross section*" OR "cross-sectional") OR AB(("prevalence" NEAR/3 "rate*") OR ("incidence" NEAR/3 "rate*") OR "prevalence" OR "incidence" OR rate* OR "cross section*" OR "cross-sectional"))	826,164

Appendix C

Quality appraisal tables using JBI checklists

Appendix C1

JBI critical appraisal checklist for cohort studies (Moola et al., 2020)

Appraisal item	**Study 1** Fergusson et al. (1995)	**Study 2** Audet (2008)	**Study 3** Crea et al. (2014)	**Study 4** Kennedy et al. (2016)	**Study 5** Kennedy et al. (2017)
1. Were the two groups similar and recruited from the same population?	Yes	Yes	Yes	Yes	Yes
2. Were the exposures measured similarly to assign people to both exposed and unexposed groups?	Yes	Yes	Yes	Yes	Yes
3. Was the exposure measured in a valid and reliable way?	Yes	Yes	Yes	Yes	Yes
4. Were confounding factors identified?	Yes	Yes	Yes	Yes	Yes
5. Were strategies to deal with confounding factors stated?	Yes	Yes	Yes	Yes	Yes
6. Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?	Unclear	Unclear	Unclear	Unclear	Unclear
7. Were the outcomes measured in a valid and reliable way?	Yes	No	Yes	Yes	Yes
8. Was the follow up time reported and sufficient to be long enough for outcomes to occur?	Yes	Yes	Yes	Yes	Yes
9. Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	Unclear	Unclear	Yes	Yes	Yes
10. Were strategies to address incomplete follow up utilized?	Not applicable	Unclear	Not applicable	Yes	Yes
11. Was appropriate statistical analysis used?	Yes	Yes	Yes	Yes	Yes

Appendix C2

JBI critical appraisal checklist for prevalence studies (Moola et al., 2020)

Appraisal item	**Study 6** Liao et al. (2017)	**Study 7** Miller et al. (2022)
1. Was the sample frame appropriate to address the target population?	Yes	Yes
2. Were study participants sampled in an appropriate way?	Yes	Unclear
3. Was the sample size adequate?	Yes	Yes
4. Were the study subjects and the setting described in detail?	Yes	Yes
5. Was the data analysis conducted with sufficient coverage of the identified sample?	Yes	Unclear
6. Were valid methods used for the identification of the condition?	Unclear	No
7. Was the condition measured in a standard, reliable way for all participants?	No	No
8. Was there appropriate statistical analysis?	Yes	Yes
9. Was the response rate adequate, and if not, was the low response rate managed appropriately?	Unclear	Unclear

Appendix D

Consolidated criteria for reporting qualitative studies (COREQ)

Developed from: Tong A, Sainsbury P, Craig J. (2007). Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. International Journal for Quality in Health Care. Volume 19, Number 6: pp. 349 – 357

Item No	Guide Questions/Description	Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/ facilitator	Which author/s conducted the interview or focus group?	71
2. Credentials	What were the researcher's credentials? E.g., PhD, MD	73
3. Occupation	What was their occupation at the time of the study?	73
4. Gender	Was the researcher male or female?	73
5. Experience and training	What experience or training did the researcher have?	73
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	70-71
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research?	70, 153
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	70, 153
Domain 2: study design		
Theoretical framework		

Item No	Guide Questions/Description	Reported on Page #
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	68
Participant selection		
10. Sampling	How were participants selected? e.g., purposive, convenience, consecutive, snowball	69-70
11. Method of approach	How were participants approached? e.g., face-to-face, telephone, mail, email	70
12. Sample size	How many participants were in the study?	71, 73
13. Non-participation Setting	How many people refused to participate or dropped out? Reasons?	70-71
14. Setting of data collection	Where was the data collected? e.g., home, clinic, workplace	71
15. Presence of nonparticipants	Was anyone else present besides the participants and researchers?	71
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	74-75
Data collection		
17. Interview guide	Were questions, prompts, and guides provided by the authors? Was it pilot tested?	68, 152
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	71
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	71
20. Field notes	Were field notes made during and/or after the interview or focus group?	71
21. Duration	What was the duration of the interviews or focus group?	71
22. Data saturation	Was data saturation discussed?	73-74
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	n/a
Domain 3: analysis and findings		
Data analysis		

Item No	Guide Questions/Description	Reported on Page #
24. Number of data coders	How many data coders coded the data?	71
25. Description of the coding tree	Did the authors provide a description of the coding tree?	72, 156
26. Derivation of themes	Were themes identified in advance or derived from the data?	71-72, 75-83, 155, 156
27. Software	What software, if applicable, was used to manage the data?	72
28. Participant checking	Did participants provide feedback on the findings?	n/a
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g., participant number	75-83
30. Data and findings consistent	Was there consistency between the data presented and the findings?	73-92
31. Clarity of major themes	Were major themes clearly presented in the findings?	75-83
32. Clarity of minor themes	Is there a description of diverse cases or a discussion of minor themes?	75-83 (e.g., 77, 78, 80)

Appendix E

Research proposals

The final project proposal (v6.5) approved by the University and included in the substantial amendment is available here*:*

https://osf.io/uy5av/files/sd83w?view_only=ca63ccc1815a47499e4b882a2976f98a

The revised proposal (v6.6) included in the non-substantial amendment is available here**:**

https://osf.io/uy5av/files/s3tqm?view_only=ca63ccc1815a47499e4b882a2976f98a

Appendix F

Ethical approvals and correspondence

Appendix F1

Ethics for wider RIGHT trial

Appendix F2

Substantial amendment ethics for current project

Appendix F3

Non-substantial amendment correspondence

Appendix F4

Site access and data collection correspondence

Appendix G

Topic guide

The topic guide developed to inform research interviews. It was approved as part of the substantial amendment and is available here:

https://osf.io/uy5av/files/93af7?view_only=ca63ccc1815a47499e4b882a2976f98a

Appendix H

Participant documentation

The participant documents approved as part of the substantial amendment are available here:

Participant information sheet (v1.4):

https://osf.io/uy5av/files/fdcek?view_only=ca63ccc1815a47499e4b882a2976f98a

Informed consent form (v1.4):

https://osf.io/uy5av/files/wsp7r?view_only=ca63ccc1815a47499e4b882a2976f98a

The revised participant documents approved as part of the non-substantial amendment are available here:

Participant information sheet (v1.5):

https://osf.io/uy5av/files/8md62?view_only=ca63ccc1815a47499e4b882a2976f98a

Informed consent form (v1.5):

https://osf.io/uy5av/files/ktjya?view_only=ca63ccc1815a47499e4b882a2976f98a

Appendix I

Data availability statement

In accordance with the approved Data Management Plan for this project (available in project proposal; Appendix E) data generated consist of video and audio interview recordings and verbatim transcripts. Due to the sensitive nature of the data, the full dataset will not be made publicly available.

Participants provided informed consent for their data to be used within the RIGHT trial. Consent was not obtained for open public data sharing beyond the research team. Complete datasets (interview recordings and transcripts) are securely stored on the University of Glasgow secure server within the RIGHT project storage. Access to data is protected through controlled access permissions restricted to authorised members of the RIGHT research team.

Following completion of the study, pseudonymised summary findings will be disseminated through academic publication and deposited in Enlighten, the University of Glasgow's research publications repository.

Appendix J

Data analysis plan

The data analysis plan, informed by Braun and Clarkes (2006) six-phase model of reflexive thematic analysis, is available here:

https://osf.io/k6xd9?view_only=ca63ccc1815a47499e4b882a2976f98a

Appendix K

Record of data analysis process

Details and examples of the data analysis process are available here:

https://osf.io/c43rf?view_only=ca63ccc1815a47499e4b882a2976f98a