

Interventions for parents of children with neurodevelopmental disorders and their effectiveness in self-compassion

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Abstract

This systematic review evaluates the efficacy of interventions designed to enhance self-compassion in parents of children with neurodevelopmental disorders (NDDs), a population documented to experience elevated levels of parenting stress. Adhering to PRISMA guidelines, a search of PubMed, Scopus, and PsycINFO (covering the period 2015 to 2025) identified studies evaluating self-compassion educational programs, training, or workshops for parents of children with NDDs. Eligible studies included Randomized Controlled Trials (RCTs) and pre-post designs using a quantitative measure of self-compassion as the outcome. Eight studies were included, featuring varied interventions like Acceptance and Commitment Therapy (ACT), psychoeducation, and Mindfulness-Based approaches. The results suggest that these interventions are generally associated with significant short-term improvements in parental self-compassion and secondary outcomes including reduced stress and depression. However, the current evidence base is limited by methodological heterogeneity. Future research must prioritize rigorous RCTs and longitudinal follow-up to establish sustainable, evidence-based practices for this population.

Keywords: self-compassion, parenting, autism, stress

Intervenções para pais de crianças com transtornos do neurodesenvolvimento e sua eficácia na promoção da autocompaixão

Resumo

Esta revisão sistemática avalia a eficácia de intervenções destinadas a aumentar a autocompaixão em pais de crianças com transtornos do neurodesenvolvimento (TND), uma população que comprovadamente apresenta níveis elevados de estresse parental. Seguindo as diretrizes PRISMA, uma busca nas bases de dados PubMed, Scopus e PsycINFO (abrangendo o período de 2015 a 2025) identificou estudos que avaliaram programas educacionais, treinamentos ou workshops sobre autocompaixão para pais de crianças com TND. Os estudos elegíveis incluíram Ensaios Clínicos Randomizados (ECR) e estudos com delineamento pré-pós, utilizando uma medida quantitativa de autocompaixão como desfecho. Oito estudos foram incluídos, apresentando intervenções variadas, como Terapia de Aceitação e Compromisso (ACT), psicoeducação e abordagens baseadas em Mindfulness. Os resultados sugerem que essas intervenções estão geralmente associadas a melhorias significativas a curto prazo na autocompaixão parental e em desfechos secundários, incluindo redução do estresse e da depressão. No entanto, a base de evidências atual é limitada pela heterogeneidade metodológica. Pesquisas futuras devem priorizar ensaios clínicos randomizados rigorosos e acompanhamento longitudinal para

estabelecer práticas sustentáveis e baseadas em evidências para essa população.

Palavras-chave: autocompaixão, parentalidade, autismo, estresse.

1. Introduction

Stress related to parenting is widespread and common (Raphael et al., 2010). Parenting stress refers to psychological distress experienced due to the demands and challenges inherent in the parental role (Abidin, 1992). Compared to parents of children with typical development, parents of children with developmental disabilities face more demanding caregiving responsibilities and report higher levels of stress (Cuzzocrea et al., 2016), depression (Scherer et al., 2019) and anxiety (Antonopoulou et al., 2020).

Children and young people with developmental disabilities represent a large and increasing population. According to NCHS, during 2019-2021, the prevalence of any diagnosed developmental disability in children, increased from 7.4% to 8.56% (Zablotsky, 2023). In 2019, around 317 million children and adolescents worldwide had health conditions that contribute to developmental disabilities (WHO, 2023). Neurodevelopmental disorders are a subset of the broader category of developmental disabilities and refer to a group of conditions that begin during the developmental period, often before a child starts grade school. They are characterized by developmental deficits that lead to impairments in personal, social, academic, or occupational functioning (Craig et al., 2016). The presumed etiology of neurodevelopmental disorders is complex and often unknown (WHO, 2023). Based on the ICD-11, neurodevelopmental disorders comprise the following diagnoses: disorders of intellectual development, developmental speech or language disorders, autism spectrum disorder (ASD), developmental learning disorder, developmental motor coordination disorder, attention deficit hyperactivity disorder (ADHD) and stereotyped movement disorder (WHO, 2023). This paper specifically targets parents of children with ASD or ADHD.

As already mentioned, parenting children with disabilities, particularly those with neurodevelopmental disorders, often entails a significant amount of parenting stress (Craig et al., 2016). Meanwhile, highly stressed parents are less effective in their parenting roles, risking their children's developmental progress (Dyken et al., 2022). Deater-Deckard (2004) provides an extensive overview of factors influencing parenting stress, such as social support, parenting education, respite care, mental health services, financial stability, time management skills, health and self-care, supportive partners, community programs, childcare services, and the role of self-compassion in managing stress and improving overall well-being. Neff & Faso (2015) highlight the role of self-compassion in reducing stress and improving well-being among parents of children with autism, and it aligns with the broader context of factors that can alleviate parenting stress.

According to Neff (2003), self-compassion is defined as the practice that involves being kind and understanding toward oneself in times of struggle or suffering, recognizing that such experiences are part of the shared human condition, and maintaining a balanced awareness of one's emotions without over-identifying with them. Moreover, Neff (2003) outlines the three core components of self-compassion: self-kindness versus self-judgment, common humanity versus isolation, and mindfulness versus over-identification. The combination of these three related components defines a person who embodies self-compassion.

The framework of self-compassion, along with strategies for confronting and adjusting emotional styles, pertains to the ways individuals regulate the intensity and duration of their emotional responses (adaptive emotional processing). This involves shifting their attention toward their emotions and modifying the nature and perceptions of their emotional states when facing stressful and challenging conditions. Individuals with self-compassion typically exhibit more adaptive emotional processing. It can be argued that greater levels of self-compassion are associated with better psychological well-being (Neff, 2009), and self-compassion can be seen as a crucial tool for managing negative life experiences (Allen; Leary, 2010).

Many studies indicate the importance of self-compassion as a factor in reducing parenting stress. In parenting children with disabilities, a parent's self-compassion is reflected in their ability to implement effective problem-solving strategies. Self-compassion involves managing negative emotions with full awareness, and it has been shown to successfully reduce anxiety and depression levels (Neff; Germen, 2012). Research by Neff & Faso (2014) demonstrates a positive relationship between self-compassion and life satisfaction, hope, and a negative relationship with depression and parental stress. Self-compassion has been found to effectively improve parents' well-being and mitigate the adverse effects of the severity of children's ASD symptoms on parents' adaptability. Dehkordian et al. (2017) found that self-compassion positively influences the parenting of children with ADHD. Wong et al. (2016) identified self-compassion as a protective factor against affiliate stigma

(internalization of external criticisms) experienced by parents of children with ASD, showing that self-compassion moderated the association between affiliate stigma and psychological distress. Research with parents of children with neurodevelopmental disabilities suggests that greater self-compassion is associated with lower stress and depression levels, even after accounting for the child's diagnosis, parental burden, and socioeconomic status (Robinson et al., 2018).

Thus, self-compassion has been shown to predict multiple outcomes and potentially contribute to reducing parenting stress and improving quality of life. Moreover, it has been proven that self-compassion interventions may facilitate emotional regulation and resilience-building among parents of children with neurodevelopmental disorders by enhancing adaptive coping strategies. Studies indicate that parents trained in self-compassion are better able to manage stressors through improved emotional self-regulation and reduced emotional reactivity, directly improving their mental health and overall life satisfaction (Kirby et al., 2019; Beaumont et al., 2021). A recent meta-analysis reveals that increasing self-compassion in parents of children with neurodevelopmental disorders may be a protective factor for their psychological health (Ozturk; Guzel, 2025).

While interventions aimed at supporting these parents have gained traction, there is a notable gap in the literature concerning evidence-based interventions specifically designed to improve parental self-compassion. This systematic review seeks to address this gap by answering the following research question: What interventions are effective in enhancing self-compassion in parents of children with neurodevelopmental disorders? By analyzing various studies, we will assess their efficacy, consider methodological limitations, and identify critical areas for future research to establish effective, standardized practices for this population.

2. Materials and Methods

2.1 Protocol and registration

This systematic review was conducted in strict accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Shamseer et al., 2015). The protocol was registered a priori with the International Prospective Register of Systematic Reviews (PROSPERO) under the registration number CRD420250576055 (available at: <https://www.crd.york.ac.uk/PROSPERO/view/CRD420250576055>). As this study is a systematic review of previously published literature, institutional ethics approval was not required.

2.2 Search strategy and information sources

A comprehensive systematic search was conducted across three electronic databases: PubMed, Scopus, and PsycINFO, covering the period from June 1, 2015, to July 15, 2025. The search strategy utilized a combination of Medical Subject Headings (MeSH) and free-text terms. The core Boolean search string applied was: (parent* OR mother* OR father*) AND ("self-compassion") AND (intervention OR training OR program OR seminar OR workshop) AND (neurodevelopmental OR autism OR ASD OR ADHD). The specific search syntax was adapted for each respective database. Furthermore, reference lists of the included studies and relevant earlier reviews were manually screened to identify any additional eligible literature.

2.3 Eligibility criteria (PICOS)

The inclusion and exclusion criteria were established a priori based on the PICOS (Population, Intervention, Comparison, Outcomes, and Study Design) framework:

Participants (P): Eligible studies included parents (mothers, fathers, or both) of children diagnosed with Autism Spectrum Disorder (ASD) or Attention Deficit Hyperactivity Disorder (ADHD). Studies were included regardless of the children's age or the initial and final sample sizes of the interventions.

Interventions (I): The review considered any intervention structured to deliver self-compassion education or training. This encompassed formal programs, seminars, workshops, or distinct sessions targeted at parents, delivered by health professionals or educators. Delivery formats could include face-to-face or online modalities, as well as individual or group-based settings.

Comparisons (C): Studies were included regardless of the presence or absence of a comparison/control group. Thus, both controlled interventions (e.g., active or waitlist control) and non-controlled approaches were eligible.

Outcomes (O): To ensure a robust evaluation of the targeted impact, studies were required to utilize at least one validated quantitative measure of self-compassion as a primary or secondary outcome variable.

Study Designs (S): Eligible study designs encompassed Randomized Controlled Trials (RCTs), non-randomized controlled trials, and uncontrolled pre-post intervention studies. Only peer-reviewed journal articles published in English between 2015 and 2025 were considered. Qualitative studies, case reports, review articles, and studies lacking quantitative data analysis were excluded.

2.4 Study selection and data extraction

Following the systematic search, all identified citations were exported to EndNote reference management software, where duplicates were automatically and manually removed. Subsequently, two independent investigators blindly screened the titles and abstracts of the retrieved records against the pre-defined eligibility criteria. Following the initial screening, the full texts of potentially eligible articles were retrieved and independently reviewed in detail by the same two investigators. Any discrepancies or disagreements between the reviewers during either phase were resolved through discussion to reach a consensus. If an agreement could not be reached, a third independent investigator was consulted. The study selection process is comprehensively mapped in the PRISMA flow diagram (Haddaway et al., 2022).

2.5 Quality assessment and risk of bias

Methodological quality and risk of bias for the included studies were rigorously appraised independently by two reviewers. For non-randomized studies (including single-arm pre-post designs), the Risk of Bias Assessment Tool for Non-Randomized Studies (RoBANS) was utilized. RoBANS provides a structured framework to evaluate bias across six key domains, ensuring a thorough judgment of methodological integrity (Smith & Noble, 2025). Conversely, for the Randomized Controlled Trials (RCTs) included in this review, the Cochrane Risk of Bias tool (RoB 2.0) was applied. This tool serves as the international standard for evaluating the internal validity of randomized trials by identifying systematic errors in study design, conduct, and reporting (Sterne et al., 2019).

2.6 Data synthesis

Due to the anticipated methodological and clinical heterogeneity among the included studies—particularly regarding the variability in intervention modalities (e.g., duration, delivery method), study designs (RCTs vs. uncontrolled pre-post studies), and the diverse characteristics of the targeted populations (ASD vs. ADHD)—a quantitative meta-analysis was deemed inappropriate. Consequently, a systematic narrative synthesis was conducted to critically integrate and interpret the findings across the studies.

3. Results

3.1 Study flow

The comprehensive search strategy initially yielded 1,852 records. Following the removal of 61 duplicates and an additional 343 records marked as ineligible by automation tools, 1,395 records were excluded during the title and abstract screening phase. The full texts of the remaining 53 studies were independently examined by the two investigators. Of these, 40 studies were excluded for irrelevance, four due to the absence of a quantitative self-compassion measure, and one because the intervention included both parents and children. Ultimately, 8 studies met all eligibility criteria and were included in this systematic review. The study selection process is illustrated in the PRISMA flow diagram (Figure 1).

3.2 Characteristics of included studies

The eight included studies comprised a total of 247 participants, all of whom were parents of neurodivergent children. Six studies recruited both mothers and fathers (Ahmed; Raj, 2023; Jones et al., 2018; Lodder et al., 2020; Lunskey et al., 2017, 2021; Pyszkowska et al., 2023), while two focused exclusively on mothers (Curl; Hampton, 2024; Gould et al., 2018).

Regarding study design, only one study utilized a Randomized Controlled Trial (RCT) methodology (Lodder et al., 2020). Among the non-randomized studies, two incorporated a control group (Lunskey et al., 2017; Pyszkowska et al., 2023), whereas the remaining five utilized uncontrolled pre-post designs (Ahmed; Raj, 2023; Curl; Hampton, 2024; Gould et al., 2018; Jones et al., 2018; Lunskey et al., 2021). Five studies included a follow-up assessment ranging from one to three months post-intervention, while three studies evaluated

outcomes only immediately after the intervention. The main characteristics of the included studies are summarized in (Table 1).

There was substantial heterogeneity in the therapeutic approaches, duration, and delivery methods of the interventions. Modalities included a multi-component psycho-educational and compassion-focused approach (Lodder et al., 2020), Acceptance and Commitment Therapy (ACT) (Gould et al., 2018; Pyszkowska et al., 2023), structured psychoeducation modules (Ahmed; Raj, 2023), combined meditation and poetry workshops (Curl; Hampton, 2024), and various mindfulness-based interventions including Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) adaptations (Jones et al., 2018; Lunsky et al., 2017, 2021). Intervention duration ranged from brief four-week online modules to comprehensive eight-week programs, delivered either face-to-face, virtually, or through asynchronous formats.

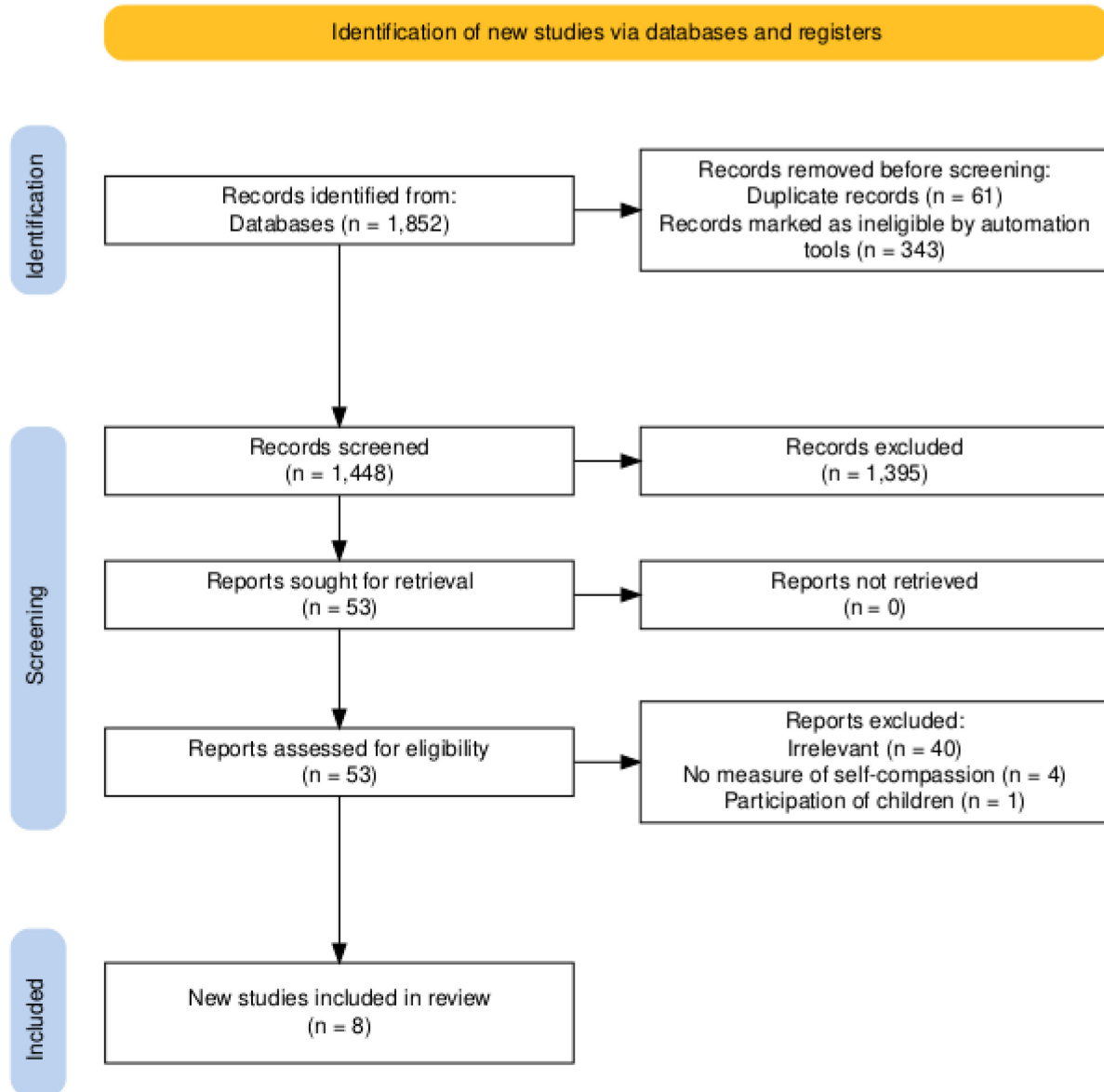


Figure 1. PRISMA flow diagram for systematic review including searches of the databases. Source: Authors, 2026.

3.3 Efficacy on self-compassion

The findings regarding the efficacy of these interventions on self-compassion must be interpreted with caution due to the varying methodological rigor of the included studies.

While the majority of the studies (7 out of 8) reported improvements in self-compassion scores, the strength of the evidence is limited by the lack of controlled comparisons. In several uncontrolled studies, participants experienced significant within-group increases in self-compassion from baseline to post-intervention (Ahmed & Raj, 2023; Curl & Hampton, 2024; Gould et al., 2018; Jones et al., 2018; Lunskey et al., 2021). However, when directly compared to control groups, the results are less robust. Notably, the sole RCT (Lodder et al., 2020) reported no significant between-group or within-group differences in self-compassion. Similarly, Pyszkowska et al. (2023) observed significant within-group increases in their ACT groups, but these differences were not statistically significant when compared to the control group. This discrepancy highlights the critical need to distinguish between absolute symptom improvement over time and intervention-specific efficacy.

3.4 Qualitative evaluation of studies

Table 2 presents the methodological quality of the RCT (Lodder et al., 2020), assessed via the RoB 2.0 tool. While rated low risk in several domains, the study exhibited an unclear risk regarding allocation concealment and a high risk of performance bias, as both personnel and participants were aware of the intervention allocation. Such unblinded conditions, common in psychological interventions, introduce expectancy biases that can inflate self-reported outcomes.

Table 3 details the RoBANS assessment for the pre-post intervention studies. A consistent pattern of bias emerged, primarily driven by a high risk of confounding variables. The absence of control groups in five of the studies severely limits the ability to attribute improvements in self-compassion solely to the interventions, as natural maturation or external factors cannot be ruled out. Consequently, while these non-randomized studies suggest potential associations between the interventions and improved self-compassion, they do not establish strong causal evidence.

Table 1. Study characteristic of included studies

Study	Study design	Population	Intervention	Control group	Parameters/ Outcome measures	Results
Lodder et al. (2020)	RCT	N = 17 parents of autistic children (1F, 16M).	SOLACE program: 8 weekly face-to-face or virtual sessions focusing on psychoeducation and compassion.	No intervention (n = 8)	SC, mental health, affiliate stigma, self-esteem, blame, social support.	• No significant between-group differences. • No significant within-group changes.
Pyszkowska et al. (2023)	Non-randomized Controlled Trial (CT)	N = 60 parents of autistic children (9F, 51M).	ACT: 4 weekly small-group sessions (2 hours each) focusing on psychological flexibility and metaphors.	No intervention (n = 20)	SC, psychological flexibility, ego-resiliency, quality of life, distress.	• SC increased significantly within both ACT groups. • No significant differences between ACT and control groups.
Gould et al. (2018)	Uncontrolled Pre-Post Design	N = 3 mothers of autistic children.	Brief ACT: 6 individual sessions (90 min each) focusing on values, mindfulness, and acceptance.	None (Uncontrolled)	SC, psychological flexibility, acceptance, family impact.	• Significant SC improvement observed in 2 out of 3 participants.
Ahmed; Raj (2023)	Uncontrolled Pre-Post Design	N = 50 parents of children with ASD/DD (2F, 48M).	Online Psychoeducation: 4 weekly experiential modules (12 min each) targeting self-kindness and mindfulness.	None (Uncontrolled)	SC, depression, stress, psychological well-being.	• Statistically significant increase in SC scores from pre- to post-intervention.in self-compassion.
Jones et al. (2018)	Uncontrolled Pre-Post Design	N = 21 parents of children with ASD/DD (3F, 18M).	MBW-P: 8 weekly sessions (2 hours each) combined with guided daily audio practices.	None (Uncontrolled)	SC, distress, parenting stress, well-being, mindfulness.	• Significant improvements in SC post-intervention.
Curl; Hampton (2024)	Uncontrolled Pre-Post Design	N = 7 mothers of autistic children.	Virtual Meditation/Poetry: 3 weekly online workshops (75 min each) using breathing techniques and poetry.	None (Uncontrolled)	SC, autistic traits, stress, parenting self-efficacy, mindfulness.	• Small but statistically significant improvement in SC over the course.

Study	Study design	Population	Intervention	Control group	Parameters/ Outcome measures	Results
Lunsky et al. (2017)	Non-randomized Controlled Trial (CT)	N = 50 parents of children with ASD/DD (15F, 35M).	MBSR: 8 weekly sessions (2 hours each) focusing on systematic mindfulness training.	Information and Support Group (n = 24)	SC, parenting stress, well-being, perceived stress, coping strategies.	• SC scores increased within the MBSR group. • Changes were not statistically significant when compared to the control group.
Lunsky et al. (2021)	Uncontrolled Pre-Post Design	N = 39 parents of autistic adolescents and adults (4F, 35M).	Adapted MBCT: 6 weekly virtual sessions + short daily audio exercises (body scan, loving-kindness).	None (Uncontrolled)	SC, mindfulness, carer burden, positive gain.	• Significant improvement in SC from pre- to post-intervention. • SC gains were successfully maintained at 3-month follow-up.

Note. ASD = Autism Spectrum Disorder; DD = Developmental Disabilities; M = Males (Fathers); F = Females (Mothers); RCT = Randomized Controlled Trial; CT = Controlled Trial; ACT = Acceptance and Commitment Therapy; MBSR = Mindfulness-Based Stress Reduction; MBCT = Mindfulness-Based Cognitive Therapy; MBW-P = Mindfulness-Based Wellness and Pedagogy; SC = Self-Compassion. Source: Authors, 2026.

4. Discussion

Parenting a child with a neurodevelopmental disorder is often associated with elevated levels of psychological distress, necessitating effective interventions to bolster parental resilience and empowerment. While various approaches have targeted stress reduction in this population (Curley et al., 2023), the present systematic review is, to our knowledge, the first to specifically evaluate interventions aiming to cultivate self-compassion among parents of neurodivergent children.

4.1 Critical synthesis of self-compassion outcomes

The existing evidence presents a complex and somewhat contradictory picture regarding the efficacy of these interventions. A critical analytical integration of the findings reveals a distinct divergence between controlled and uncontrolled study designs, underscoring the need for a cautious interpretation.

The majority of uncontrolled pre-post studies (e.g., Ahmed; Raj, 2023; Curl; Hampton, 2024; Jones et al., 2018; Lunskey et al., 2021) reported significant improvements in self-compassion. In contrast, studies incorporating control groups failed to demonstrate significant between-group superiority for the active interventions. The sole RCT (Lodder et al., 2020) found no significant differences, and the controlled ACT intervention by Pyszkowska et al. (2023) yielded increases that were not statistically significant relative to the control group.

This methodological discrepancy suggests that while parents generally report feeling more self-compassionate after participating in these programs, these improvements cannot yet be definitively attributed to the specific active ingredients of the therapies. The observed gains in uncontrolled studies may be partially influenced by non-specific therapeutic factors, such as the Hawthorne effect, the passage of time, peer support inherent in group settings, or placebo expectations.

Furthermore, the variability in outcomes may be moderated by intervention delivery and "dosage." Interventions that explicitly targeted self-compassion through dedicated, experiential modules (e.g., Ahmed; Raj, 2023) appeared to yield more direct improvements in the construct compared to broader interventions (e.g., Lodder et al., 2020) where self-compassion was only one of several cognitive restructuring components. This suggests that cultivating self-compassion may require targeted, sustained practice rather than peripheral psychoeducation. Additionally, the lack of long-term follow-up in nearly half of the included studies leaves a critical gap in our understanding of whether these psychological gains are maintained once the structured support of the intervention ceases.

4.2 Impact on secondary psychological outcomes

Beyond self-compassion, the critical synthesis of secondary outcomes indicates that these interventions offer broad, multifaceted benefits for parental mental health. Across various therapeutic modalities (ACT, MBCT, and psychoeducation), studies consistently reported significant reductions in psychological distress, including depression, anxiety, and parenting stress (Ahmed; Raj, 2023; Jones et al., 2018; Lunskey et al., 2021; Pyszkowska et al., 2023).

Moreover, several interventions successfully promoted positive psychological constructs. ACT protocols effectively increased psychological flexibility and values-directed behavior (Gould et al., 2018; Pyszkowska et al., 2023), while mindfulness-based programs enhanced general mindfulness and positive caregiving perceptions (Jones et al., 2018; Lunskey et al., 2021). Notably, the SOLACE program (Lodder et al., 2020) demonstrated significant, sustained reductions in courtesy and affiliate stigma, highlighting the social utility of group-based psychoeducation.

Collectively, these secondary findings suggest that even if the direct, controlled impact on self-compassion remains inconclusive, parent-focused interventions provide a valuable, comprehensive support system. By addressing distress, stigma, and psychological rigidity simultaneously, these programs equip parents with healthier coping mechanisms, ultimately fostering a more resilient caregiving environment for neurodivergent children.

Table 2: Methodological quality of RCT study

Study	Random sequence allocation	Allocation concealed	Blinding of study personnel	Blinding of participants	Blinding of outcome assessment	Incomplete outcome data addressed	Free of selective reporting	Free of other bias	Overall rating
Lodder et al. (2020)	Low risk ¹	Unclear risk ²	High risk ³	High risk ⁴	Low risk ⁵	Low risk ⁶	Low risk ⁷	Unclear risk ⁸	High risk

¹ Clearly described method

² Not explicitly mentioned

³ Personnel likely aware of allocation

⁴ Participants aware of their group allocation

⁵ Outcome assessors blinded

⁶ Complete reporting of data

⁷ No evidence of selective reporting

⁸ Insufficient details provided

Table 3 Summary of methodological quality pre-post intervention studies

Study	Selection of participants	Confounding variables	Measurement of exposure	Blinding of outcome assessment (detection bias)	Incomplete outcome data addressed	Free of selective reporting	Free of other bias
Pyszkowska et al. (2023)	Moderate risk ⁹	High risk ¹⁰	Low risk ¹¹	Moderate risk ¹²	Moderate risk ¹³	Low risk ¹⁴	Moderate risk ¹⁵
Gould et al. (2018)	Moderate risk ⁹	High risk ¹⁰	Low risk ¹¹	Moderate risk ¹²	Moderate risk ¹³	Low risk ¹⁴	Moderate risk ¹⁵
Ahmed & Raj (2023)	Moderate risk ⁹	High risk ¹⁰	Low risk ¹¹	Moderate risk ¹²	Moderate risk ¹³	Low risk ¹⁴	Moderate risk ¹⁵
Jones et al. (2018)	Moderate risk ⁹	High risk ¹⁰	Low risk ¹¹	Moderate risk ¹²	Moderate risk ¹³	Low risk ¹⁴	Moderate risk ¹⁵
Curl & Hampton (2024)	Moderate risk ⁹	High risk ¹⁰	Low risk ¹¹	Moderate risk ¹²	Moderate risk ¹³	Low risk ¹⁴	Moderate risk ¹⁵
Lunsky et al. (2017)	Moderate risk ⁹	High risk ¹⁰	Low risk ¹¹	Moderate risk ¹²	Moderate risk ¹³	Low risk ¹⁴	Moderate risk ¹⁵
Lunsky et al. (2021)	Moderate risk ⁹	High risk ¹⁰	Low risk ¹¹	Moderate risk ¹²	Moderate risk ¹³	Low risk ¹⁴	Moderate risk ¹⁵

⁹Insufficient description of sampling

¹⁰Limited control for external variables

¹¹Clearly described exposure

¹²Unclear if assessors were blinded

¹³Attrition noted

¹⁴Outcomes transparently reported

¹⁵Limited methodological details

5. Limitations

This systematic review faces certain limitations. The variability and seemingly contradictory findings across the studies regarding self-compassion outcomes can be primarily attributed to crucial methodological differences and, to a lesser extent, potential variations in sample characteristics or specific intervention nuances. The most significant factor for contradictory findings and variability is study design. The majority of studies are non-randomized pre-post intervention designs, often lacking a control group. While these studies frequently report "significant increases" or "improvements" in self-compassion within the intervention group, these findings are susceptible to confounding variables.

Without randomization, pre-existing differences between participants, or external factors could drive the observed changes, making it difficult to attribute improvements directly and solely to the intervention. Moreover, when non-randomized studies include a control group, they sometimes find within-group improvements but no significant between-group differences. For instance, Pyszkowska et al. (2023) showed self-compassion increases in ACT groups, but no significant differences when compared with the control group. This suggests that the act of participating in any structured program, or other non-specific factors, might contribute to improvements, rather than the specific therapeutic content.

Even Lodder et al. (2020), despite being an RCT (the strongest design), explicitly reported no significant between- or within-group differences in self-compassion scores for either group. This finding stands in direct contrast to many other studies. This could be due to the specific intervention content of SOLACE not optimally targeting self-compassion, the specific measure used, or insufficient power to detect a subtle effect on this particular outcome, even if other mental health indicators improved. This highlights that even rigorous designs do not guarantee significant findings for every outcome. Furthermore, the presence of follow-up data helps confirm the durability of improvements.

Studies without follow-up (Ahmed et al., 2023; Jones et al., 2018; Curl; Hampton, 2023) cannot confirm long-term effects, even if immediate post-intervention results are positive. Finally, the overall interpretation of these studies is significantly limited by small sample sizes and the high variability in intervention formats and durations, severely restricting the generalizability of findings. Given these combined methodological constraints, the positive trends observed across studies must be interpreted with caution. At present, the evidence base is not sufficiently robust to support definitive causal conclusions or to allow for broad generalizations regarding the most effective intervention designs.

6. Implications for Future Research

To address current methodological gaps and strengthen the evidence base, future investigations should prioritize the following:

- **Rigorous Randomized Controlled Trials (RCTs):** There is a pressing need for well-designed RCTs incorporating robust control groups, adequate statistical power, and appropriate blinding of outcome assessors. Such designs are essential to establish the causal efficacy of self-compassion interventions.
- **Standardization of Protocols:** Future studies should aim for greater consistency in intervention protocols, clearly documenting specific content, duration, and delivery methods. This standardization would facilitate direct comparisons and enable meta-analyses to identify optimal dosage and core therapeutic components.
- **Expansion of sample size:** Larger cohorts are necessary to enhance statistical power and improve the generalizability of findings.
- **Longitudinal Assessment:** Future research must include long-term follow-up assessments (6 to 12 months) to determine the durability of self-compassion gains.

7. Clinical Implications

While awaiting more robust research, clinicians can consider several actionable steps to support parents of children with neurodevelopmental disorders. Implementing interventions that directly teach and encourage self-compassion skills, such as mindfulness-based practices and Acceptance and Commitment Therapy (ACT), is a promising approach. Given the evidence, clinicians should integrate components like self-kindness, common humanity, and mindfulness into their support programs. These interventions should be delivered in flexible formats, such as short online modules or group workshops, to accommodate parents' demanding schedules. Clinicians should also highlight the broader benefits of these skills, such as improvements in overall well-being

and reductions in stress, to encourage engagement and reinforce the value of these practices.

8. Conclusions

This systematic review underscores the significant and widespread burden of stress experienced by parents of children with neurodevelopmental disorders. These parents manage unique and demanding caregiving responsibilities that can profoundly impact their mental health and overall well-being. Within this context, targeted interventions emerge as a promising pathway for support, offering essential tools to mitigate psychological distress and enhance adaptive coping and self-compassion.

Our analysis revealed encouraging trends. The majority of reviewed studies indicate that various interventions successfully improve parents' self-compassion, well-being, and positive perceptions of caregiving. However, the current evidence base possesses notable limitations. The heterogeneity of intervention designs, coupled with a reliance on non-randomized studies, makes definitive causal conclusions difficult to establish. The absence of long-term follow-up data in several studies leaves questions about the long-term durability of these positive changes. Further research is needed, specifically to include parents of children with other neurodevelopmental disorder subtypes.

Ultimately, research should prioritize evaluating the cost-effectiveness and accessibility of these interventions. Online delivery, for instance, offers a viable way to reach parents who face significant time and logistical barriers to in-person support. Given the immense societal and economic value of supporting caregivers for children with neurodevelopmental disorders, there is a clear imperative for policymakers and funding bodies to invest in and sustain programs that promote parental resilience.

9. Authors' Contributions

Foteini Papageorgiou: conceptualization, methodology, literature search and strategy, screening and study selection, analysis and synthesis, quality assessment, writing -original draft preparation, writing review and editing, project administration. *Filomeni Armakola*: literature search and strategy, screening and study selection. *Anna Tsiakir*: analysis and synthesis, quality assessment. *Theodoros Sergeantanis*: Literature search and strategy, quality assessment. *Panagoula Papadimitropoulou*: screening and study selection. *Ioanna Katsouri*: supervision. *Pinelopi Vlotinou*: conceptualization, methodology, writing -original draft preparation, writing review and editing, supervision. All authors have read and agreed to the published version of the manuscript.

10. Conflicts of Interest

The authors declare no conflicts of interest.

11. Ethics Approval

Not applicable.

12. References

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