Positive Psychology Interventions (PPIs) for Parental Stress in Parents of Children with Neurodevelopmental Disabilities: A Systematic Review

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Abstract

Neurodevelopmental disorders (NDDs) affect not only the individual, but also pose unique challenges to their immediate family and carers. Evidence suggests that the parents of children with NDDs experience higher stress and symptoms of depression and anxiety, compared to parents of neurotypical children. Positive psychology interventions (PPIs) is a tool that can help improve their well-being and reduce parental stress. This review sought to create an extensive overview of existing PPIs and their functions, as well as to answer the following research questions: (a) What type/format of positive psychology interventions have been used to improve parental well-being among parents of children with NDDs? (b) What mental health components have been targeted with the interventions? and (c) What are the parent's experiences and needs regarding positive psychology interventions? Following a range of search strategies across three electronic databases (PubMed, PsycINFO, and SCOPUS) a total of 10 studies met the inclusion criteria of PPIs aimed to improve parental well-being in parents or carers of children under the age of 18, diagnosed with an NDD. Results showed a wide variety of PPIs such as self-compassion interventions, mentalization intervention, (virtual) resiliency interventions, perspective taking intervention, gratitude interventions, mindfulness-based stress reduction and positive adult development. These interventions further targeted mental health components such as stress, depression, stigma, distress, anxiety, self-esteem, self-efficacy, well-being, and insomnia and had a small to medium effect on them. Not enough qualitative data was found to make a statement on parent's experiences and needs regarding positive psychology interventions, however the review brings future points of discussion and research to light, identifying gaps in literature and providing implications for practice.

Keywords: positive psychology interventions, parent intervention, parental stress, parental well-being, neurodevelopmental disorder, systematic review

Introduction

Neurodevelopmental disorders (NDDs) are a group of disorders that commonly begin in early childhood and affect the development of the nervous system, leading to abnormalities in brain development and functioning, making these disorders chronic conditions that persist for life. Often the developmental deficits produce impairments in personal, social, academic, or occupational functioning (Morris-Rosendahl & Crocq, 2020). NDDs include a multitude of disorders such as intellectual disability (ID), attention-deficit/hyperactivity disorder (ADHD), autistic spectrum disorder (ASD), communication disorders (CD), specific learning disorder (SLD), and motor disorders (MDs, such as Tourette's) (Francés et al., 2022).

According to the National Center for Health Statistics (NCHS) in 2015 in the United States of America, an estimated 15% of children aged 3 to 17 years are affected by NDDs. Prevalence rates for the most common NDDs are estimated as follows: ADHD = 7.9–9.5%; ASD = 0.7–2.2%; SLD = 1.2–24%; and motor coordination disorder = 1.4–19% (Francés et al., 2022). However, global prevalence of NDDs often vary, ranging from 4.70% in Scotland, 55.5% in Norway and 88.50% in Japan (Francés et al., 2022). These variations could be due to the detection and diagnosis rate in different countries, with NDDs tending to be underdiagnosed in developing countries (Francés et al., 2022). Still, according to Cainelli and Bisiacchi (2022), regardless of detection rates in developing countries, NDDs are becoming more widespread and there is a noticeable trend over the years of numbers of NDD diagnoses increasing. Furthermore, it is important to note that often times these disorders are also comorbid, with a high prevalence of comorbidity between ASD and ADHD – 22% to 83% of children with ASD have symptoms that satisfy the DSM-IV criteria for ADHD, whereas 30% to 65% of children with ADHD have clinically significant symptoms of ASD (Morris-Rosendahl & Crocq, 2020).

While these disorders cause great suffering for children and reduce their quality of life (Francés et al., 2022), they also affect the parents or caregivers by lowering their quality of life and bringing a

considerable amount of burden, mental strain and parental stress (Faden et al., 2023). Parents of children diagnosed with NDDs are an at-risk group that require more attention and intervention to help them deal with the mental load of raising their children, receiving less support, and facing stigma (Faden et al., 2023).

Caregivers of children with NDDs play a central role in their education process and helping their rehabilitation and integration into society. However, that also makes them prone to experience tremendous amounts of stress and psychosocial problems (Purpura et al., 2021). Research shows that parents of children with NDDs experience higher levels of distress compared to those of typically developing (TD) children, and they experience more mental health problems such as anxiety or depression (Faden et al., 2023). Furthermore, parents of children with NDDs often experience lack of social support, financial problems, and marital/relationship problems which all contribute to higher levels of parental distress (Burnett et al., 2021). Other common stressors experienced by parents of children with NDDs are poor acceptance of the diagnosis (Boyd, 2002), severity of the child's symptoms (Boyd, 2002), emotional stress and strain (Corcoran et al., 2015), stigmatization (Corcoran et al., 2015), time constrain and lack of personal leisure time (Davy et al., 2022), feeling shame (Kim et al., 2020), and lack of knowledge about ASD (Samsell et al., 2022). Despite the caregiver's pivotal role in the child's life, often their mental health is overlooked.

Different reviews have outlined coping mechanisms often exhibited by parents of children diagnosed with NDDs. Coping mechanisms employed by parents can be generally divided into positive (e.g. information seeking, seeking family, social or spiritual support, acceptance) and the more commonly seen negative coping mechanisms (e.g. denial, concealment, disconnection, self-blame, emotional detachment, or substance use) (Martínez-Montilla, 2016). A study by Dunn et al. (2001) has also provided evidence that an avoidant coping styles, such as distancing or escape, significantly correlates with depression in parents of children with ASD. Another common coping mechanism often employed by

Asian or Arab parents is religion (Alkhateeb et al., 2022; Shorey et al., 2020; Kim et al., 2020). A review by Ghanouni and Hood (2021) further makes a distinction between problem focused coping strategies which aim to resolve stressful situations (e.g. active coping, planning, suppression of competing negative activities, and positive reinterpretation) and emotion focused coping strategies which aim to reduce negative emotional responses (e.g. denial, focusing on and venting of emotions, behavioral disengagement, and mental disengagement). Research points out that high stress levels, lack of social support, and ineffective coping styles are leading predictors of unfavorable psychological outcomes (Mancil et al., 2009).

As a result of these stressors, parents of children with NDDs may be more vulnerable to depression and anxiety, which in turn can cause impaired functioning, poor health and lack of self-care (Olsson & Hwang, 2001). For this specific target group positive psychology interventions may be an effective tool in reducing depression and anxiety rates, and improving their quality of life and wellbeing, as well as helping them to have healthy coping strategies and deal with burdens and stressors.

Positive psychology is a scientific approach to studying human thoughts, feelings, and behavior, with a focus on strengths instead of weaknesses, building the positive aspects in life instead of repairing the bad (Peterson, 2008). Positive psychology focuses on efforts to ensure that people have meaningful life experiences and can prevent or cope with pathologies that appear when life is hard by focusing on positive subjective experiences, individual traits and institutions (Seligman & Csikszentmihalyi, 2000).

As positive psychology is still a relatively new and continuously growing flied, there are many theories and constructs pertaining to it. Some more known positive psychology constructs include mindfulness, positive affect, enjoyment, authenticity, (self-) compassion, self-acceptance, gratitude, hope, optimism, engagement, (finding) meaning, accomplishment and perseverance (Seligman & Csikszentmihalyi, 2000). These constructs are not fixed traits in an individual; they can be complementary to one another and can be taught and enhanced. As positive psychology is a

multidimensional tool these constructs can be used and combined into different exercises which can be then utilized by the individual to help reduce anxiety and relieve symptoms of depression, as well as increase resilience (Peterson, 2008).

Positive psychology often has a strong focus on mindfulness, as mindfulness-based treatment programs have been shown to have a positive impact on the psychological health of individuals, most notably: improvements in mood and quality of life, a reduction in perceived stress and burnout, and a reduction in depressive relapse. The strongest evidence for use of mindfulness-based interventions (MBIs) has been in depression and anxiety and within the adult population rather than child mental health services (Hofmann et al., 2010).

Positive psychology interventions (PPIs) often incorporate one or more of these positive psychology constructs to increase happiness, wellbeing, positive cognitions and emotions in individuals (Keyes et al., 2012). According to Sin and Lyubomirsky (2009), positive psychology interventions aim to enhance happiness through positive thoughts and emotions and sustain the effects in the long term - they can be a form of training, exercise or therapy which are unlike traditional interventions where the goal is to reduce symptoms, problems or disorders. Therefore, for an intervention to be classified as a PPI it should be explicitly developed with the traditional theoretical background of positive psychology. According to a literature review by Parks and Schueller (2014) PPIs can be divided into seven categories based on content: (1) *Savoring PPIs* which focus on enhancing and savoring a particular experience, (2) *Gratitude Interventions* which focus on enhancing feelings of gratitude which can be either self-reflective or interactive, (3) *Kindness Boosters* which promote acts of kindness to enhance happiness and compassion, (4) *Empathy PPIs* which focus on strengthening positive emotions in interpersonal relationships by practicing self-love, communication and mindfulness, (5) *Optimistic Interventions* which aim to create positive outcomes by setting realistic expectations, (6) *Strength-Building Measures* which help to improve internal capacities and values help an individual to use their vitality wisely, and finally

(7) *Meaning Oriented PPIs* which help in finding meaning in life and what can be done to achieve the things that matter in life by setting goals. PPIs have shown to be effective in reducing stress and depressive symptoms as well as increasing the satisfaction with life of individuals (Carr et. al., 2020), hence why it is ideal for the target group of parents to children diagnosed with NDDs.

Aim

With the constant increase in diagnoses of neurodevelopmental disorders, more parents will experience stress and negative effects on their physical and mental well-being, and therefore require interventions to help relieve these symptoms. As such, it is important to research what existing interventions there are that can assist this target population. Currently, only two other reviews by Frantz et al. (2016) and Da Paz (2015) have looked into mental health interventions of parents of children with ASD. What this review aims to do is change the scope by focusing on positive psychology interventions specifically and widening the target group to parents of children with neurodevelopmental disorders in general. As such, the purpose of this review is to provide a systematic overview of PPIs, their design, the constructs they utilize and what stressors they can reduce for parents of children with NDDs, as well as give a sense of the effectiveness and satisfaction of these interventions. With that in mind, the current review aims to answer the following research questions: (a) What type/format of positive psychology interventions have been used to improve parental well-being among parents of children with NDDs? (b) What mental health components have been targeted with the interventions? and (c) What are the parent's experiences and needs regarding positive psychology interventions? With this review a gap in literature can be bridged, allowing for a comparison between the existing interventions and creating an elaborate overview of which interventions can satisfy which needs of the parents. Furthermore, this review can help outline any trends, limitations or changes necessary to further help cater to the needs of this specific target group.

Methods

Inclusion criteria

For this systematic review, the inclusion criteria were studies (a) presented original research published in a peer-reviewed English language journal, (b) that included a positive psychology intervention (excluding psychoeducation, and excluding mindfulness interventions and acceptance commitment therapy (ACT) unless part of a multicomponent intervention) aimed at parents of children (under the age of 18) with a neurodevelopmental disorder diagnosis, which experience parental stress, (c) with mental health related outcome measures (e.g. mental well-being, parenting stress, anxiety, depression), that were either quantitative or qualitative. Discursive and theoretical papers, as well as book chapters, editorials, and letters were excluded. Studies focusing on interventions for siblings of children with NDDs, interventions for parents and children combined, interventions for formal caregivers (e.g. nurses), or studies focusing on psychoeducation were also excluded.

Search strategy

The following three electronic databases were searched without an indicated range for year of publishing: PubMed, PsycINFO, and SCOPUS. Boolean operators were used in search strings to combine terms for (1) different NDDs; (2) descriptors for the parents that include mothers, father, and caregivers, as well as their stress or mental health; (3) various positive psychology interventions such as compassion, kindness, optimism, or gratitude; (4) intervention descriptors such as intervention, treatment, or therapy; and (5) study design descriptors such as outcome or evaluation, which are less specified in order to also include qualitative studies. The full search strategy and search stings used can be found in Appendix 1.

Study screening and selection

Following electronic searches, retrieved records were uploaded to EndNote (http://endnote.com) where duplicates were removed. The total amount of articles was then screened by a single reviewer and sorted into different categories within EndNote. The first round of screening was done based on titles and abstracts, while the final set of records marked as relevant were screened in full.

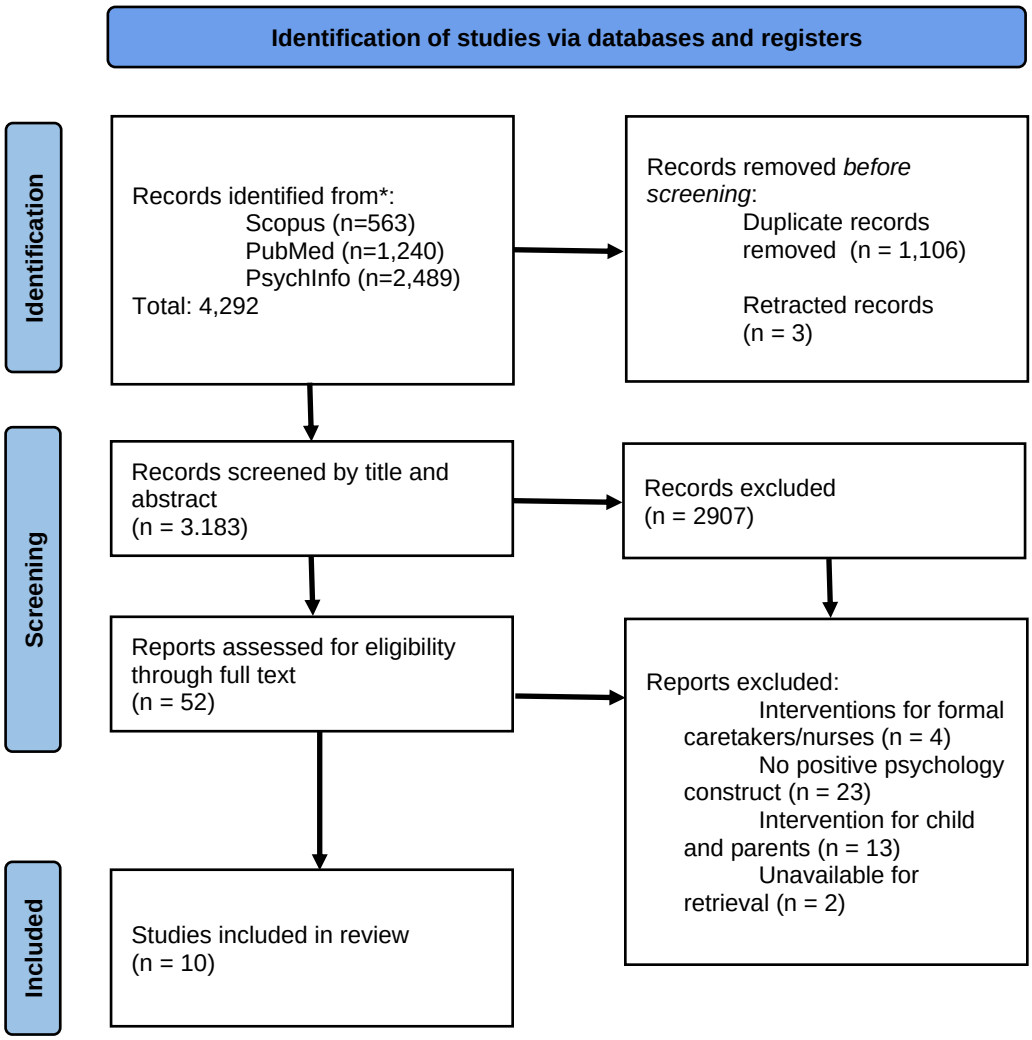
Figure 1 contains a PRISMA (Moher et al., 2009) flow diagram of the search process. Through electronic searches, 3,187 separate records were identified after duplicates and retracted records were removed. When the titles and abstracts of these were screened, 52 relevant papers were downloaded for full-text screening. A final set of 10 papers, which met inclusion and exclusion criteria, were selected for review.

Data extraction and study quality assessment

Data were extracted on publication date and type, country where the study was conducted, participant characteristics (child diagnosis, age, gender), PPI characteristics (type, delivery mode, duration, guidance, positive psychology construct, stressors targeted), as well as study design, control group condition, assessment points, outcome measures, effect size and adherence. Furthermore, adherence will be classified into good (>80% attendance rate), moderate (>50% attendance rate), and poor (<50% attendance rate).

Figure 1.

PRISMA Flow Diagram



Results

From the total of 4,292 articles initially found by the search, only 52 were assessed as eligible for full-text screening, of which only 10 met the criteria and were included in this review. These articles were published between the years 2014 and 2023, making them all relatively recent. The interventions originate from the USA, UK and Turkey and have small to medium size experimental groups (sample sizes ranging from 17 to 243). The selected interventions include pre-post experimental designs, randomized control trials, non-randomized studies and mixed method studies and there was only one feasibility study. Tables

1 and 2 below give a detailed overview of all articles, and each article is denotated with a number—henceforth the articles included in this review will be referenced in closed brackets with the corresponding number from the tables for the sake of readability.

Intervention Characteristics

The intervention and population characteristics can be found in Table 1. Across all ten interventions there were multiple positive psychology constructs present: self-compassion (n=3), empathy (n=2), mindfulness (n=2), acceptance (n=2), optimism (n=1), resilience (n=3), awareness based self-compassion (n=3), hope and gratitude (n=2), and mentalization (n=1). As mentioned earlier in the text, mindfulness and acceptance are included in this review only if they are a part of a multicomponent PPI, such. On that note, three of these intervention were multicomponent and incorporated more than one construct [2, 6, 9], and one of these also compared two different constructs and their effect (MBSR vs PAD) [2].

Mental health components targeted across these interventions include stress, depression, stigma, distress, anxiety, self-esteem, self-efficacy, well-being, and insomnia. Four of these interventions were delivered online [1, 4, 7, 10], five were delivered faced to face [2, 3, 5, 8, 9], and one was a hybrid [6]. Of these ten interventions, seven were conducted in a group setting and three were an individual intervention [1, 7, 10], two of these individual interventions can also be considered self-help interventions [7, 10].

The duration of these interventions varies between three days to ten weeks. One intervention was three days long [7], two were four weeks long [1, 3], two were six weeks long [2, 8], four were eight weeks long [4, 6, 9, 10], and only one had a 10-week duration [5]. Moreover, six of the interventions had a therapist or mental health professional present to guide the process, while the other four did not [1, 5, 6, 7]. Two interventions utilized other parents as peer-mentors who received training to be able to facilitate the interventions [2, 8].

Table 1.

Population and Intervention Characteristics

Author(s)	Target population characteristics			Intervention characteristics				
	Country	**Type of NDD of child**	**Positive psychology construct**	**Delivery mode**	**Treatment type**	**Duration**	**Guidance of a therapist**	**Mental health components targeted**
[1] Ahmed and Raj (2023)	USA	DS, ADHD, ASD, I(D)D, GDD	Self-compassion, self-kindness, common humanity, mindfulness	Online	Individual	4 weeks	None	Stress, depression, internalized stigma, well-being
[2] Dykens et al. (2014)	USA	ASD, DD	Mindfulness-Based Stress Reduction (MBSR) and Positive Adult Development (PAD)	Face to face	Group	6 weeks	Trained peer-mentors	Depression, anxiety, insomnia, distress, child interaction, well-being
[3] Enav et al. (2019)	USA/Switzerland	ASD	Mentalization, emotional regulation	Face to face	Group	4 weeks	Yes	Emotional regulation, reflective functioning, self-efficacy
[4] Kuhlthau et al. (2020)	USA	ASD	Resiliency, mind-body	Online	Group	8 weeks	Yes	Perceived stress
[5] Kulbaş and Özabacı (2022)	Turkey	ID	Awareness based self-compassion	Face to face	Group	10 weeks	None	Stress, depression, anxiety
[6] Lodder et al. (2020)	UK	ASD	Resilience, self-esteem, social support, compassion, acceptance	Mixed: face to face and videoconferencing	Group	8 weeks	None	Stigma, low self-esteem
[7] Lovell et al. (2023)	UK	ASD	Empathy, perspective taking	Online	Individual / Self-help	3 days	None	Psychological distress, depression
[8] Martin et al. (2019)	UK	ASD, ADHD, GDD	Hope, gratitude	Face to face	Group	6 weeks	Trained peer-mentors	Stress, anxiety, depression
[9] Schwarzman et al. (2022)	USA	ASD	Acceptance, mindfulness, optimism, resilience (AMOR)	Face to face	Group	8 weeks	Yes	Stress, internalized stigma, depression, anxiety
[10] Timmons et al. (2018)	USA	ASD	Gratitude	Online	Individual / Self-help	8 weeks	None	Wellbeing, parenting self-efficacy, positive maternal characteristics, relationship quality

* DD - Developmental Disorder , * DS - Down Syndrome, * ADHD - Attention Deficit Hyperactivity Disorder , * ASD - Autism Spectrum Disorder, * I(D)D - Intellectual (Developmental) Disability , * GDD - Global Developmental Delay

Table 2.

Study Characteristics

Author(s)	Study characteristics						Outcomes		
	Design	**Participants**	**Gender**	**Age M (SD)**	**Control condition (n)**	**Assessment points**	**Outcome measures + Questionnaire**	**Effect / Effect size**	**Adherence**
[1] Ahmed and Raj (2023)	Pre-post design	Parents of children diagnosed with an NDD (n = 50)	Mothers (96%)	42 (8)	None	Baseline Post intervention (4 weeks)	Self-compassion: SCS Mental well-being: WEMBS Depression: DASS Anxiety: DASS	d = 0.46** d = 0.34 d = 0.34 d = 0.40	Not reported
[2] Dykens et al. (2014)	RCT with two arms and pre-post test design	Mothers of children with ASD and DD (n=243)	Mothers (100%)	41 (9)	MSRB (n=116) PAD (n=127) No control	Baseline Mid-treatment Post intervention (1, 3, and 6 months)	Depression: BDI Anxiety: BAI Insomnia: ISI Well-being: RSPWB Life Satisfaction: LSS Distress: PSI Dysfunctional parent child Interactions: PSI	d = 0.98** d = 0.81** d = 0.67 d = -0.38 d = -0.43 d = 0.49 d = 0.29	Good adherence (83% attendance)
[3] Enav et al. (2019)	Non-randomized study	Parents of children with ASD (n = 68)	Mothers (81%)	IG 46 (7) DT 44 (8)	IG (n = 38) DT (n = 30)	Baseline Post intervention (4 weeks)	Parental reflective functioning: PDI Emotion regulation beliefs: ITE Emotion regulation: ERQ Parental self-efficacy: PSOC	d = 0.79** d = 0.41** nothing reported d = 0.37**	Not reported
[4] Kuhlthau et al. (2020)	Waitlist RCT with a pre-post design	Parents of children with ASD (n = 51)	Mothers (96%)	45 (8)	IG (n = 25) WLC (n = 26)	Baseline Post intervention (3 months, 6 months)	Distress: VAS Resiliency: CES Stress Coping: MOCS-A Worry: PSWQ Depression and Anxiety: PHQ-4 Social Support: MOS-SSS Positive Affect: PANAS-P Perspective Taking Subscale: IRI Mindfulness: CAMS-R Parental Stress: PSS	d = .38 d = .69** d = 1.12** d = .31 d = .64** d = .65** d = .60 d = .52 d = .77** not reported	Not reported

Author(s)	Study characteristics						Outcomes		
	Design	**Participants**	**Gender**	**Age M (SD)**	**Control condition (n)**	**Assessment points**	**Outcome measures + Questionnaire**	**Effect / Effect size**	**Adherence**
[5] Kulbaş and Özabacı (2022)	Mixed-design	Mothers of children with an intellectual disability (n = 35)	Mothers (100%)	Not available	PPBOGC (n = 12) Placebo (n = 11) Control (n = 12)	Baseline Post intervention (10 weeks) Follow up (2 months)	Psychological Well-Being: PWBS Self-Compassion: SCS Hope: DHS Satisfaction: Semi-structured interview	Not reported	Not measured
[6] Lodder et al. (2020)	Feasibility mixed methods, parallel RCT	Parents of children with ASD (n = 17)	Mothers (94%)	SOLACE 35 (6) CG 39 (9)	SOLACE (n = 9) CG (n = 8)	Baseline Post intervention (8 weeks) Follow up (6 weeks)	Mental Health: MHI-5 Courtesy Stigma Levels: PCSS Affiliate Stigma: ASS Self-esteem: R-10SES Self-Compassion: SCS-SF Positive Meaning of Caregiving: combined study by Mayers et al. (2009) and the PBS Self-blame: SBRS Social Support: SSS Social Isolation: UCLA	Not reported	Good adherence (94% attendance)
[7] Lovell et al. (2023)	Pre-post design	Parents of children with ASD (n = 24)	Mothers (96%)	41 (6)	None	Baseline Post intervention (7, 14, 21 days)	Depression and anxiety: HADS Cognitive and affective empathy: QCAE Utility and satisfaction: USE	Not reported	Not measured
[8] Martin et al. (2019)	Pre-post design	Parents of children with DD (n = 108)	Mothers (85%)	39 (7)	None	Baseline Post intervention (immediate)	Hope: ASHS Gratitude: GQ-6 Positive mental well-being: WEMWBS Depression: HADS Anxiety: HADS	d = 1.02** d = 0.90** d = 1.10** d = 0.81** d = 0.81**	Decent adherence (50% attended all sessions)
[9] Schwarzman et al. (2022)	RCT of two parallel groups	Parents of children with ASD (n = 34)	Mothers (76%)	AMOR 40 (4) DTG 43 (5)	AMOR (n = 17) DT (n = 17)	Baseline Post intervention (8 weeks) Follow up (8 weeks)	Resilience: CD-RISC-25 Parental Stress: PSI-4-SF Psychological inflexibility: AAQ-II Dispositional mindfulness: MAAS Optimism: LOT-R Self-compassion: SCS-SF Self-efficacy: GSES Depression: DASS-21 Anxiety: DASS-21 Stress: DASS-21	d = 1.42** d = 1.47** d = 0.69 d = 1.08** d = 1.11** d = 1.09** d = 0.88** d = 0.62 d = 0.94** d = 0.99**	Not measured

Author(s)	Study characteristics						Outcomes		
	Design	**Participants**	**Gender**	**Age M (SD)**	**Control condition (n)**	**Assessment points**	**Outcome measures + Questionnaire**	**Effect / Effect size**	**Adherence**
[10] Timmons et al. (2018)	Pre-post design	Parents of children with ASD (n = 64)	Mothers (100%)	40 (7)	GG (n = 24) CSG (n = 19) CG (n = 21)	Baseline Post intervention (8 weeks) Follow up (1 month)	Depression: CES-D Stress: SHS Life satisfaction: SWLS Satisfaction: PSOC Self-efficacy: PSOC Child behavior: SDQ Optimism: LOT-R Benefit finding: LOT-R Relationship quality: DCI	*GG/CSG/CG* d = 0.54/0.57/0.29 d = 0.43/0.43/0.41 d = 0.20/0.40/0.41 d = 0.27/0.32/0.46 d = 0.40/0.49/0.25 d = 0.34/0.30/0.07 d = 0.21/0.25/0.30 d = 0.19/0.32/0.21 d = 0.34/0.30/0.07	Not reported

** – significant effect size

Control conditions: IG – intervention group, DT – delayed treatment, WLC – waitlist control, CG – control group, GG – general gratitude group, CSG – child specific gratitude group, MBSR – Mindfulness-Based Stress Reduction, PAD – Positive Adult Development, PPBOGC – Psychology-Based Online Group Counselling, SOLACE – Stigma of Living as an Autism Carer, AMOR – Acceptance, Mindfulness, Optimism, Resilience

Questionnaires: SCS – Self-Compassion Scale, WEMBS – The Warwick-Edinburgh Mental Wellbeing Scale, DASS-21 – Depression Anxiety Stress Scale, BDI – Beck Depression Inventory, BAI – Beck Anxiety Inventory, ISI – Insomnia Severity Index, RSPWB – Ryff Scales of Psychological Well-being, LSS – Life Satisfaction Scale, PDI – Psychological Distress Inventory, ERQ – Emotion Regulation Questionnaire, PSOC – Parenting Sense of Competence, CES – Carer Experience Scale, MOCS-A – Measure of Current Status, PSWQ – Penn State Worry Questionnaire, PHQ-4 – Patient Health Questionnaire, MOS-SSS – Medical Outcomes Study Social Support Survey, PANAS-P – Positive and Negative Affect Schedule, IRI – Interpersonal Reactivity Index, CAMS-R – Cognitive and Affective Mindfulness Scale-Revised, PSS – Perceived Stress Scale, PWBS – Psychological Wellbeing Scale, MHI-5 – Mental Health Inventory, ASS – Adversity and Stress Scale, PBS – Positive Behavior Support, UCLA – University of California, Los Angeles Loneliness Scale, HADS – Hospital Anxiety and Depression Scale, QCAE – Questionnaire of Cognitive and Affective Empathy, USE – Usefulness, Satisfaction, and Ease of Use Questionnaire, GQ-6 – Gratitude Questionnaire, CD-RISC-25 – The Connor-Davidson Resilience Scale, PSI-4 – Parenting Stress Index, AAQ-II – Acceptance and Action Questionnaire, MAAS – The Mindful Attention Awareness Scale, LOT-R – Revised Life Orientation Test, GSES – General Self-Efficacy Scale, SHS – Subjective Happiness Scale, SWLS – Satisfaction with Life Scale, SDQ – Strengths and Difficulties Questionnaire, DCI – Dyadic Coping Inventory, ITE – Implicit Theory of Emotion, VAS – Visual Analog Scale, DHS – Dispositional Hope Scale, PCSS – Perceived Courtesy Stigma Scale, R-10SES – Rosenberg's Self-Esteem Scale, SBRS – The Self-blame and Responsibility Scale, ASHS – Adult State Hope Scale

Study Characteristics

Table 2 above gives a detailed overview of the study characteristics and participant characteristics. There is a lot of diversity across the participants in all these interventions. A total of 694 participants took part across the 10 interventions, and the sample sizes tend to be moderate, averaging at 69, with one intervention having a small sample size (<20) [6], and one having a large sample size (>200) [2]. The majority of the participants were mothers (92.4%), with three of the interventions being conducted solely with mothers [2, 5, 10]. The average age of the participants ranges between 35 and 46 (M=41). The neurodevelopmental disorders present in the children of the participants include developmental DD (n=1), ADHD (n=2), ASD (n=9), IDD (n=2) and GDD (n=2), and the children's ages ranged between 3 and 18.

Regarding the design—four of the interventions have a pre-post design [1, 7, 8, 10], three are a randomized control trial [2, 4, 9], two have mixed methods [5, 6] and one was a non-randomized study [3]. The mixed method studies and a single study with a pre-post design [1, 5, 6] explore qualitative dimensions by asking participants about the gains of such an intervention and creating focus groups to evaluate the acceptability of the intervention.

Control conditions were present in seven of the interventions, while three had no control condition [1, 7, 8]. As mentioned in the first paragraph of this section, one of these interventions compares MBSR and PAD and therefore has two experimental conditions instead of having a control group [2].

Adherence was measured in four of the interventions, two of which had very good adherence (>80%) [2, 6], and one which was moderate (>50%) [8]. The other seven interventions did not have adherence measured. Other than adherence, the selected studies for this review also measured acceptability [1, 5, 6], feasibility [4, 6, 9] and utility and satisfaction [7].

Outcomes

A lot of different questionnaires were utilized to measure each factor, however most common outcome measures were regarding depression, anxiety, well-being, self-compassion, self-efficacy, stress, and distress.

Depression

Seven studies assessed depression using five different questionnaires, namely DASS-21 [1, 9], HADS [8, 7], PHQ-4 [4], BDI [2], and CES-D [10]. One study did not report any effect sizes at all [7], and in three of these seven studies a significant reduction in depressive feelings was found with medium to large effect sizes ranging from 0.64 to 0.98 [2, 4, 8]. In the remaining three interventions no significant effects on depression were found with effect sizes ranging from 0.34 to 0.57 [1, 9, 10].

Anxiety

Six studies assessed anxiety utilizing the DASS-21 [1, 9], HADS [7, 8], PHQ-4 [4]and BAI [2] questionnaires. Four of the six studies reported significant reductions in anxiety with medium to large effect sizes ranging from 0.64 to 0.94. From the remaining two studies one did not have a significant reduction on anxiety with an effect size of 0.40 [1] and one did not report any effect sizes at all [7].

Well-Being

Five studies in total assessed well-being (also referred to as mental health) using four different questionnaires, namely WEMWBS [1, 8], RSPWB [2], PWBS [5] and MHI-5 [6]. Only one of these studies found a significant improvement in well-being [8] with a large effect size of 1.10. Two studies did not report any effect sizes at all [5,6] and the other two did not find any significant improvement in well-being with small effect sizes of 0.34 [1] and -0.38 [2].

Self-compassion

Four studies assess self-compassion with the same questionnaire, namely the SCS [1, 9, 5, 6]. Two of the studies did not report any effects [5,6], while the other two reported a significant positive effect on self-compassion with effect sizes of 0.46 [1] and 1.09 [9].

Self-efficacy

Three studies examined self-efficacy and utilized two questionnaires to do that - PSOC [3, 10] and GSES [9]. Two of the studies reported a significant increase in self-efficacy with effect sizes ranging from 0.88 [3] to 0.37 [9], while the last one did not report any significant effects [10].

Stress

A total of three studies focused on stress, with a distinction between parental stress and general stress. Questionnaires utilized for parental stress were the PSS [4], and the PSI-4-SF [9], and for general stress DASS-21 [9] and the SHS [10]. One of the studies did not report any effect sizes [4], another reported no significant effects on stress [10], and the final study reported a significant reduction in both general stress and parental stress with large effect sizes of 0.99 and 1.47 respectively [9].

Distress

Two studies used questionnaires to examine distress is participants, namely the PSI [2] and the VAS [4] and neither showed a significant reduction in distress.

Life Satisfaction

Two studies focused on life satisfaction using the LSS [2] and SWLS [10] to assess life satisfaction, however neither reported a significant effect.

Resilience

Two questionnaires across two interventions were used to measure resilience, namely CD-RISC-25 [9] and the CES [4] and both reported a significant increase in resilience with effect sizes ranging from 0.69 [4] to 1.42 [9].

Mindfulness

Two studies examined mindfulness utilizing CAMS-R [4] and MAAS [9], and both reported a significant increase with large effect sizes ranging from 0.77 [4] to 1.08 [9].

Hope

Hope was assessed using the DHS [5] and the ASHS [8]. One did not report any effects [5], while the other noted a significant increase in hope with a large effect size of 1.02 [8].

Other

Dykens et al. (2014) [2] examined two other outcome measures, namely insomnia and dysfunctional parent child interactions, measured by the ISI and PSI respectively, both of which did not report a significant effect.

A study by Enav et al. (2019) [3] assessed emotion regulation beliefs and emotion regulation. The questionnaires they used to measure those are the ITE and the ERQ respectively. The study did not report any effects on emotion regulation at all, but did find a significant effect on emotional regulation beliefs with a medium effect size of 0.41. Furthermore, they also measured parental reflective functioning using the PDI questionnaire and that showed a significant effect on reflective functioning with a large effect size of 0.79.

Kuhlthau et al. (2020) [4] further looked into stress coping by using the MOCS-A, worry by using the PSWQ, social support with the MOS-SSS, positive affect with the PANAS-P, and perspective taking with the IRI. Of these only stress coping and social support reported significant effects with effect sizes of 1.12 and 0.65 respectively.

Kulbaş and Özabacı (2022) [5] and Lovell et al. (2023) [7] looked at satisfaction with the intervention by utilizing a semi-structured interview and the USE respectively, however the papers did not report any effects for utility and satisfaction.

Lodder at al. (2020) [6] investigated courtesy stigma levels (PCSS), affiliate stigma (ASS), self-esteem (R-10SES), positive meaning of caregiving (combined study by Mayers et al. (2009) and the PBS), self-blame (SBRS), social support (SSS), and social isolation (UCLA) but did not report any effect sizes in their study.

Lovell et al. (2023) [7] examined cognitive and affective empathy using the QCAE, but they did not report any effect sizes. Martin et al. (2019) [8] examined gratitude with the GQ-6 and reported a significant effect on gratitude with a large effect size of 0.90. Schwarzman et al. (2022) [9] used the AAQ-II to measure psychological inflexibility and the LOT-R to measure optimism, of which only the latter had a significant increase in optimism with a large effect size of 1.11. Lastly, Timmons et al. (2018) [10] measured child behavior with the SDQ, optimism and benefit finding with the LOT-R, and relationship quality with the DCI, none of which reported a significant effect, with small to medium effect sizes ranging between 0.07 and 0.57.

Qualitative Findings

Despite there being two mixed method studies, one does not report the qualitative results as it is a feasibility study [6]. Two studies in total report any qualitative findings regarding parent’s feedback on the intervention [1] and gains attained by participating in the intervention [5].

Regrading parents feedback on the intervention modules [1] parents report finding self-reflecting, considering own health, exploring self-compassion, remembering that to be imperfect is to be human, and taking time to observe one's emotions as very helpful during the modules, and outline needing more action items, having a male representative to talk to, having more resources at hand, having other examples of how parents can also make mistakes, and needing some type of breathing exercise as suggestions for improvement.

In relation to gains attained by participants while partaking in the intervention [5], five general themes were outlined, namely learning how to cope, recognizing sources of support, empathy, development and positive perception-acceptance. Parents state that that the intervention has raised their awareness, and have reflected on past experiences, allowing them to gain new perspectives. Parents further express stress relief by simply having someone to talk and relate to, which in turn helped them gain a more positive perspective on life.

Lastly, one study [10] performs a linguistic analysis on parents in general gratitude and child specific gratitude intervention groups, showing that the general gratitude group condition use more words of gratitude in their journal entries. No further qualitative results can be found across the ten studies included in this review.

Discussion

This review aimed to explore current existing interventions utilizing positive psychology constructs and aimed at helping parents of children with neurodevelopmental disorders to reduce stress and increase well-being. From the total of 4,292 articles initially outlined by the search across three platforms, only 10 met the criteria for this review, ranging between the years 2014 and 2023, making them all relatively recent. Positive psychology in itself is still a very new concept, hence why applying it to help this specific target group of parents of children with NDDs yields so few results. The findings of

this review also suggest a variety of future research questions related to our a priori research questions: (a) What type/format of positive psychology interventions have been used to improve parental well-being among parents of children with NDDs? (b) What mental health components have been targeted with the interventions? and (c) What are the parent's experiences and needs regarding positive psychology interventions?

Regarding the first research question, several different intervention types were characterized in the current review, including self-compassion interventions, a mentalization intervention, (virtual) resiliency interventions, a perspective taking intervention, gratitude interventions, mindfulness-based stress reduction and positive adult development intervention. As mentioned in the beginning of this paper, Parks and Schueller (2014) divided PPIs into seven categories and it can be said that the interventions included in this review can be generally grouped under gratitude, empathy and strength building PPIs.

Overall, there is a great amount of diversity between positive psychology constructs utilized in these interventions and some of these interventions (n=3) were actually multi-component. The reason multi-component interventions were also included in this review is because a study by Hendriks et al. (2019) discusses the benefits of multiple component interventions and how they allow for more in-depth look into combinations that can help the target group. Hendriks et al. (2019) define multicomponent PPI's as "interventions that contain a variety of evidence-based individual exercises and targeting two or more theoretically relevant hedonic and eudaimonic well-being components, that are conducted within an integral program". Their study further finds that multicomponent PPI's can have a small effect on subjective well-being and depression, and a small to moderate effect on psychological well-being, which more of less falls in line with the findings of this review. An interesting future topic of research would be a study investigating multiple positive psychological constructs combined into one big multicomponent intervention. That would allow for further understanding the benefits of multicomponent PPIs as well as comparing different constructs to one another to establish which ones are most effective.

Furthermore, regarding the format of PPIs found, seven out of 10 studies in this review used a group approach, rather than an individual approach. A reason for that could be that group interventions are more practical and allow for more participants, are more time efficient and less costly than individual interventions, but also provide therapeutic advantages in the form of forming meaningful connections and having a sense of belonging (Muralidhar et al., 2018). However, this can also be seen as a downside as it can also be a barrier to parent's uptake with such interventions. An individual intervention can be perceived as more catered to the specific needs of each family and make it more appealing to participate. Interestingly, among the articles included in this review there are only two self-help interventions, despite those being arguably the easiest to utilize. More research, in particularly qualitative research, regarding parents' preference between a group or an individual approach would be beneficial in further tailoring these PPIs to their needs.

The second research question postulates (b) What mental health components have been targeted with the interventions? A wide variety of mental health components such as stress, depression, stigma, distress, anxiety, self-esteem, self-efficacy, well-being, and insomnia have been found to be targeted by these PPIs, however concerning their effectiveness to reduce or improve these mental health components, a noticeable trend across the ten articles is that they all predominantly report small to medium effects. Some of the articles included do not even report any effect sizes, and only two studies out of the 10 have consistently large and significant effect sizes. This in turns makes the results regarding efficacy of PPIs inconclusive, with limited practical application. No adverse effects were noted in any of the interventions, but one did report negative effect sizes on well-being and life satisfaction, indicating the opposite effect of what was expected, which in this case is for well-being and satisfaction with life to increase (Dykens et al., 2014). The predominantly small to medium effect sizes of the PPIs in this review are comparable to the findings of a previous review by Carr et al. (2020) on the effectiveness of PPIs, which showed that they also found a small to medium statistically significant effects on anxiety, stress, quality of life,

strengths, well-being and depression. Therefore, no concise conclusion can be made regarding the effectiveness of these PPIs to reduce or improve the mental health components targeted.

The third and final research question pertains to the parent's perceptions regarding the PPIs, namely (c) What are the parent's experiences and needs regarding positive psychology interventions? Little to no qualitative information was included in the 10 articles included in this review, therefore no conclusive answer can be given to the third research question. While qualitative analysis provides many advantages in the form of insights on psychological phenomena and the deeper understanding of participant perceptions on what is effective and what can improve, it also comes with a myriad of disadvantages, such as time-consuming and labor-intensive (Cissé and Rasmussen, 2022) which may be an explanation for the lack of qualitative data across the studies in this review. On the other hand, providing qualitative data in the context of participant feedback on satisfaction with the interventions would be beneficial in ensuring future research on this topic tailors the interventions to the specific needs of the target group. For future research, the inclusion of qualitative data gathering is highly advised as it is the tool that can provide the most insight into the needs and expectations of this specific target group.

However, regarding the needs and expectations of the parents regarding PPIs another noticeable trend should be taken into consideration, namely that the interventions included primarily target mothers as participants. A skewed target group predominantly consisting of mothers would most likely indicate different needs and expectations of these PPIs than fathers would. A study by Sicouri et al. (2018) outlines barriers for father participation in such interventions, namely their perception that interventions are mother-focused, their beliefs about gender roles, mothers' role as 'gatekeeper', their lack of knowledge and awareness of parent interventions; and lack of relevance of interventions. This suggests that fathers can be seen as a completely separate target group and there needs to be more research regarding their specific needs and more measures taken to overcome these barriers and get them to be more involved in such interventions. Here a qualitative analysis would also be beneficial in understanding

the reason behind fathers' lack of participation in interventions like these, which in turn will help overcome this obstacle. Treating fathers as a separate target group is necessary to understand their needs before being able to combine them in an intervention for both caregivers.

Earlier reviews in a similar context have been made, namely a narrative review by Da Paz and Wallander (2017) that focuses on interventions that target to improve the wellbeing of parents of children with ASD specifically. The review by Da Paz and Wallander (2017) encompasses a total of 13 studies and similarly to this review the number of mother participants greatly outnumbers fathers due to their caregiver role. Interventions outlined in their review are Stress Management and Relaxation Techniques, Expressive Writing, Mindfulness Based Stress Reduction, Acceptance and Commitment Therapy, as well as Cognitive Behavioral Therapy (CBT), Mindfulness Training, Positive Psychology, Relaxation Therapy, and Family Systems Therapy. What Da Paz and Wallander (2017) conclude is that there are two distinctive approaches to help the parents of children with ASD, namely (a) the provision of active in-the-moment tools to attenuate mental illness symptomology (i.e. reductions in levels of anxiety, depression, and emotional distress) and (b) efforts to increase psychological well-being through concepts such as acceptance, forgiveness, gratitude, mindfulness, and self-compassion. These findings also fall in line with the current review.

Another review by Frantz and Machalicek (2017) with the same aim as Da Paz and Wallander (2017) includes a total of 2147 parent participants across 41 articles included in their review, and they extracted data on stress/anxiety, depression, and self-efficacy. A variety of different interventions were outlined to target parent outcomes, including psychoeducational programs, CBT, mindfulness-based stress reduction, behaviorally based programs, and others. This differs from the current review as the exclusion criteria for this review includes all these types of interventions. Another small difference is that the review by Frantz and Machalicek (2017) has a larger portion of father participants. The results of their review points toward the effectiveness of these interventions in supporting parents of children with ASD.

Strengths and Limitations

A strength of this review is that it encompasses a lot of interventions that all utilize different positive psychology constructs and that allows for a functional comparison between them, i.e. understanding the difference between different positive psychology constructs and how they can improve well-being and reduce negative symptoms. Furthermore, many trends existing within these PPIs have been uncovered and that can help bridge the gap between literature and practice, opening the future for more research. A future direction that may be crucial to explore despite being costly and time consuming is to compare all these positive psychology constructs and related techniques with one another within one singular intervention. Combining the quantitative analysis with an extensive qualitative analysis of parent's perceptions of such an intervention would be interesting and enriching in clarifying which constructs are the most efficient in reducing negative symptoms and improving quality of life.

The present literature review also has several limitations. First off, this review does not evaluate the quality of each study in the traditional manner i.e. utilizing the PRISMA guidelines. A paper by Teixeira da Silvaa and Daly (2024) discusses a disadvantage of the PRISMA guidelines in the sense that it can lead to as much as 99.97% of the published literature being ignored, which in turn suggests that valid publications might be at risk of being ignored. Furthermore, this review in particular is to serve as a general overview of existing PPIs in an elaborate way that would describe which positive psychological constructs are utilized in each intervention, and which stressors they target. However, the quality of the studies has not been completely ignored, as attention has been paid to feasibility and acceptability measures, attendance measures, and the detailed and correct reporting of their results. Future research is encouraged to include a more detailed and rigorous method of quality evaluation for the studies examined.

Another limitation of the present review is that as it includes several different types of interventions, they do not have overlap over one another and therefore a clear conclusion cannot be drawn

about the effectiveness of various types of interventions, as it is not comparable. Furthermore, this review lacks in qualitative information, which means participants level of satisfaction with the interventions is unclear. Further research focusing on qualitative data obtained from PPIs aimed at parents of children with NDDs is needed as it can give even more insight into the target group's needs, expectations, and general satisfaction with the interventions, what they would change and how they think it could improve. That in itself will provide the groundwork needed for the creation of more PPIs.

Conclusion

Parents of children with NDDs are often experiencing high levels of stress, depression, and anxiety due to unique challenges in raising a child with an NDD. The current review suggests some promising positive psychology interventions that can help reduce stress and negative symptoms as well as increase well-being and life satisfaction in parents, through mindfulness, empathy, gratitude, hope and other positive psychology constructs. Despite it's much more narrow scope, this review falls in line with previous reviews of interventions for parents of children with ASD and adds onto them by focusing the effort into one specific target group. Literature reviews like this help to accumulate extensive overviews of existing interventions and approaches that can later be adapted to more specific target groups. The studies included in this review hint at a promising direction towards mental and physical health enhancements for parents and it warrants for more research to address the needs and expectations of these parents, which in turn will help alleviate even more their psychological distress.

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Appendix 1. Search Strategy

Scopus

#1 TITLE-ABS-KEY(({positive psych*} OR {positive emotion*} OR {positive cognition} OR {positive behavio*} OR {positive feeling*} OR compassion OR mindfulness OR optimism OR gratitude OR kindness OR positive affect OR enjoyment OR authenticity OR {self compassion} OR acceptance OR hope OR engagement OR meaning OR {finding meaning} OR accomplishment* OR perseverance OR savoring OR empathy OR strength* OR {well being} OR well-being OR wellbeing OR happy OR happiness OR {life satisfaction} OR {satisfaction with life})

#2 TITLE-ABS-KEY(intervention* OR therap* OR treatment* OR training* OR program* OR exercise)

#3 TITLE-ABS-KEY(parent* OR mother* OR father* OR caregiver* OR {parental stress} OR {maternal stress} OR {paternal stress} OR {maternal depression} OR {paternal depression} OR burden OR {mental health})

#4 TITLE-ABS-KEY({neurodevelopment* disorder} OR PDDNOS OR {Pervasive Developmental Disorder Not Otherwise Specified} OR autis* OR {autism spectrum disorder} OR {Asperger*} OR adhd OR {attention deficit hyperactivity disorder} OR {intellectual disability} OR {communication disorder*} OR {specific learning disorder*} OR {motor disorder*} OR {Tourette* Syndrome})

#5 TITLE-ABS-KEY(effect* OR effic* OR outcome*)

#1 AND #2 AND #3 AND #4 AND #5 (filters: English, article)

Results: 563 (limited to English & articles)

PubMed

(“positive psych*”[tiab] OR “positive emotion*”[tiab] OR “positive cognition” [tiab] OR “positive behavio*”[tiab] OR “positive feeling*”[tiab] OR compassion[tiab] OR mindfulness[tiab] OR optimism[tiab] OR gratitude[tiab] OR kindness[tiab] OR positive affect[tiab] OR enjoyment[tiab] OR authenticity[tiab] OR “self compassion” [tiab] OR acceptance[tiab] OR hope[tiab] OR engagement[tiab] OR meaning[tiab] OR “finding meaning” [tiab] OR accomplishment*[tiab] OR perseverance[tiab] OR savoring[tiab] OR empathy[tiab] OR strength*[tiab] OR “well being”[tiab] OR well-being[tiab] OR

wellbeing[tiab] OR happy[tiab] OR happiness[tiab] OR “life satisfaction” [tiab] OR “satisfaction with life” [tiab])

AND (intervention*[tiab] OR therap*[tiab] OR treatment*[tiab] OR training*[tiab] OR program*[tiab] OR exercise[tiab])

AND (parent*[tiab] OR mother*[tiab] OR father*[tiab] OR caregiver*[tiab] OR “parental stress”[tiab] OR “maternal stress”[tiab] OR “paternal stress”[tiab] OR “maternal depression”[tiab] OR “paternal depression”[tiab] OR burden[tiab] OR “mental health”[tiab])

AND (“neurodevelopment* disorder” [tiab] OR PDDNOS[tiab] OR “Pervasive Developmental Disorder Not Otherwise Specified” [tiab] OR autis*[tiab] OR “autism spectrum disorder” [tiab] OR “Asperger*”[tiab] OR adhd[tiab] OR “attention deficit hyperactivity disorder”[tiab] OR “intellectual disability”[tiab] OR “communication disorder*”[tiab] OR “specific learning disorder*”[tiab] OR “motor disorder*”[tiab] OR “Tourette* Syndrome”[tiab])

AND (effect*[tiab] OR effic*[tiab] OR outcome*[tiab])

Results: 1,240 (limited to English)

PsycInfo

(“positive psych*” OR “positive emotion*” OR “positive cognition” OR “positive behavio*” OR “positive feeling*” OR compassion OR mindfulness OR optimism OR gratitude OR kindness OR positive affect OR enjoyment OR authenticity OR “self compassion” OR acceptance OR hope OR engagement OR meaning OR “finding meaning” OR accomplishment* OR perseverance OR savoring OR empathy OR strength* OR “well being” OR well-being OR wellbeing OR happy OR happiness OR “life satisfaction” OR “satisfaction with life”)

AND (intervention* OR therap* OR treatment* OR training* OR program* OR exercise)

AND (parent* OR mother* OR father* OR caregiver* OR “parental stress” OR “maternal stress” OR “paternal stress” OR “maternal depression” OR “paternal depression” OR burden OR “mental health”)

AND (“neurodevelopment* disorder” OR PDDNOS OR “Pervasive Developmental Disorder Not Otherwise Specified” OR autis* OR “autism spectrum disorder” OR “Asperger*” OR adhd OR “attention

deficit hyperactivity disorder" OR "intellectual disability" OR "communication disorder*" OR "specific learning disorder*" OR "motor disorder*" OR "Tourette* Syndrome")

AND (effect* OR effic* OR outcome*)

Results: 2,489 (limited to English and academic journal)