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Interventions that target improvements in mental health for parents of children with autism spectrum disorders: A narrative review☆

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HIGHLIGHTS

- Narrative review of mental health interventions for parents of autistic children
- Some treatments reported improvements in stress, depression, and anxiety.
- Post-test produced weaker effects than follow-up assessments two months and beyond.
- Small sample size, homogeneity, and self-report limited generalizability of results
- Outcomes encouraging, but existing data cannot yet support definitive conclusions

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ABSTRACT

Prevalence of autism spectrum disorders (ASD) suggest that one in 68 children is affected. With convincing evidence that parenting a child with ASD is associated with elevated distress and mental health problems, researchers have begun to investigate treatments that directly target parents' psychological well-being. We conducted a narrative review of studies that empirically tested the effects of interventions targeting improvements in the mental health of parents of children with ASD. Following a range of search strategies, a total of 13 studies, seven randomized controlled trials (RCTs) and six pre-post test designs, met inclusion criteria. We calculated and reported effect sizes for all RCTs. On average, treatment produced medium to large effect sizes with improvements in parenting stress and general health, and reductions in depression and anxiety. Interventions that appeared promising included: Stress Management and Relaxation Techniques, Expressive Writing, Mindfulness-Based Stress Reduction, and Acceptance and Commitment Therapy. However, only one study conducted a follow-up assessment >3 months post intervention. Study populations primarily consisted of English-speaking mothers, ages 39 to 42 years. Conclusions were limited by small sample sizes, homogeneity of sample population, and reliance on self-report. Therefore, this body of research contains significant limitations in need of improvement for this field to move forward and benefit a sizable number of parents.

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By definition, children with autism spectrum disorders (ASD) exhibit restricted and repetitive behaviors with qualitative impairments in communication and social interaction (American Psychiatric Association, 2013). These collective deficiencies oftentimes negatively impact the parents, resulting in deleterious health consequences, such as diminished maternal health related quality of life (HRQOL) (Allik, Larsson, & Smedje, 2006) or increased problems in physical health and reported bodily pain (Khanna et al., 2011). In comparison to parents of typically functioning children or parents of children with other developmental disabilities (i.e. intellectual disability or cerebral palsy), parents or caregivers of children with ASD also experience a higher incidence of negative psychological outcomes, such as depression, anxiety, and emotional distress (Mugno, Ruta, D'Arrigo, & Mazzone, 2007; Weiss, 2002).

Extensive research has examined factors associated with adverse effects on the mental health of parents caring for a child with ASD. Some have found that a positive linear relationship exists between severity of the child's autism symptoms and an increase in maternal stress levels (Hastings et al., 2005). From a literature review, Boyd (2002) concluded that a paucity of social support contributes to a deterioration in maternal mental health. Dunn, Burbine, Bowers, and Tantleff-Dunn (2001) provided evidence that avoidant coping styles, such as distancing and escape, significantly correlated with depression in parents of children with ASD. Further research suggests that elevated stress levels, lack of social support, and ineffective coping styles are leading predictors of unfavorable psychological outcomes (Mancil, Boyd, & Bedesem, 2009; Tehee, Honan, & Hevey, 2008). While some research has indicated positive effects associated with parenting a child with ASD such as increased spirituality (Ekas, Whitman, & Shivers, 2009) or increased compassion and acceptance of differences (Pakenham, Sofronoff, & Samios, 2004), accumulating evidence maintains that a vast majority of parents experience negative psychological outcomes when caring for a child with ASD.

In light of the challenges and adverse consequences that these parents experience, researchers have tested two intervention modalities: (1) parent training, which targets the improvement of parenting skill for dealing with difficult child behaviors and (2) parent education, a modality that shapes parental expectations and understanding of the child's behavior (Kaminski, Valle, Filene, & Boyle, 2008). Several reviews have systematically evaluated the effectiveness of these programs on outcomes specific to *children with ASD*, such as improvement in language skills, development of social skills, and behavior management (Brookman-Frazee, Stahmer, Baker-Ericzén, & Tsai, 2006; Matson, Mahan, & Matson, 2009; McConachie & Diggle, 2007; Patterson, Smith, & Mirenda, 2012; Schultz, Schmidt, & Stichter, 2011).

Although intervention was focused on child outcomes, some reviewers have also discussed indirect outcomes related to parental mental health. For example, Brookman-Frazee et al. (2006) reviewed parent training and parent education interventions that primarily focused on managing and improving child behaviors. However, parental effects were considered collateral outcomes and not targeted directly. Matson et al. (2009) reviewed interventions training parents as child therapists and noted parental increases in knowledge about autism and parent-reported improvement in the parent-child relationship. However, they did not formally examine parental psychological health. McConachie and Diggle (2007) reviewed studies of parent-implemented interventions for preschool children with ASD and concluded that limitations in these studies prevented examining significant treatment effects for parental mental health.

With ASD prevalence rates increasing from 1:10,000 in 1981 to now 1:68 (Wingate et al., 2014) and the convincing evidence that parenting a child with ASD is associated with elevated distress (Hastings et al., 2005; Mancil et al., 2009; Tehee et al., 2008), researchers have begun to investigate interventions that directly target parents' psychological well-being (Bitsika & Sharpley, 2000; Bristol, Gallagher, & Holt, 1993; Ferraioli & Harris, 2013). Starting in the late 1990s, this research area has grown considerably such that within a recent four year span (2010–2014), the number of intervention studies targeting ASD parent mental health has surpassed twofold the previous decade. However, this growing literature on treatments for parents' psychological well-being has not yet been reviewed.

We are aware of one meta-analysis that examined treatments for parents of children with various developmental disabilities, but which included children diagnosed with developmental disabilities (non-specified), intellectual disabilities, traumatic brain injury, as well as autism (Singer, Ethridge, & Aldana, 2007). Out of the 17 studies reviewed, only four investigated interventions designed exclusively for parents of children with an ASD diagnosis (Bristol et al., 1993; Drew et al., 2002; Salt et al., 2002; Tonge et al., 2006). There are no published reviews of research examining treatments aimed specifically at alleviating negative psychological outcomes associated with parenting a child with ASD.

With the continual upsurge in the rates of ASD diagnoses, more parents will require relief from negative psychological effects associated with their parenting experiences. As such, it is important to establish an evidence base of parent-focused clinical treatments in the context of ASD. To do so would contribute a much needed synthesis of research on mental health interventions for a growing population of uniquely distressed parents. Moreover, such a review would not only inform on best practices, but also, it may serve as an impetus to expand the research. With this in mind, this review shall examine empirical studies on interventions for parents of children with ASD that directly target improvements in parental mental health.

1. Method

1.1. Search strategy

To identify studies to be included in this review, we conducted a comprehensive search of several psychological and social science online databases, including The Cochrane Library, ERIC (Education Resources Information Center), PAIS International (Public Affairs Information Service), PILOTS (Published Literature on Traumatic Stress), ProQuest Dissertations & Theses, PsycARTICLES, PsycINFO, PubMed, Social Services Abstracts, and Sociological Abstracts. The search was limited to studies presented in English. Key word search terms included autism spectrum disorders, parent intervention or program, parent training, parent education, stress management, stress reduction, therapy, and mental health. From these initial queries, several therapy modalities emerged: acceptance and commitment therapy, cognitive behavioral therapy, and mindfulness training. Advanced searches were conducted with filters for combinations of the key words and therapy modalities located in the title and/or in the document abstract. In addition to published articles in scholarly journals, unpublished dissertations, theses, and conference papers were also included in the search. Additional sources included manual searches of reference lists and bibliographies from key articles. There were no restrictions placed on the year of publication, document presentation, or material submission.

1.2. Inclusion criteria

The purpose of this review is to evaluate research that directly assists parents in managing their own well-being in the context of parenting a child on the autism spectrum. Studies were selected if three conditions were met: (a) the majority of the study population consisted of parents of children with ASD; (b) primary study outcomes targeted improvements in caregiver mental health; and (c) the study tested the effects of a parent-focused intervention with at least a baseline-to-post implementation assessment design. After meeting these criteria, studies were included that utilized quantitative measurement rather than qualitative report of mental health outcomes such as anxiety, coping style, depressive symptoms, psychological distress, quality of life, and self-efficacy. A total of 13 studies met inclusion criteria.

2. Review of intervention approaches

2.1. Treatment modalities

Most interventions presented a single treatment modality. These included cognitive behavioral therapy (Feinberg et al., 2014; Kenney, 2010), expressive writing (Campbell, 2003; Whitney & Smith, 2014), mindfulness training (Benn, Akiva, Arel, & Roeser, 2012; Ferraioli & Harris, 2013), positive psychology strategies (LaPlante, 2013), and relaxation therapy (Gika et al., 2012). One study utilized a two-arm intervention design comparing the effects of two separate therapies (mindfulness training versus positive psychology) (Dykens, Fisher, Taylor, Lambert, & Miodrag, 2014). Four studies, employed a mixed-model approach that combined elements from various therapies and treatment techniques. Peck (1998) combined elements of parent stress management training with family systems therapy. Two studies investigated acceptance and commitment therapy, which combines cognitive behavioral therapy with mindfulness techniques (Blackledge & Hayes, 2006; Kowalkowski, 2013). The following provides further details of these interventions grouped by treatment modality.

2.2. Single-modality approaches

2.2.1. Cognitive behavioral therapy (CBT)

Both Feinberg et al. (2014) and Kenney (2010) investigated the effect of CBT interventions on improving depressive symptoms and reducing parenting stress for primary caregivers of children with ASD. Feinberg and colleagues investigated the use of a manual-based CBT intervention, Problem-Solving Education (PSE). The trained interventionists helped the participant through several steps: (a) identify feelings associated with a single problem, (b) change participant's focus from feelings to solutions that solve the problem, and (c) create an action plan and generate specific steps to achieve the solution. Similarly, Kenney (2010) examined Solution-Focused Brief Therapy (SFBT), a CBT intervention that guided participants through an identification of a problem combined with an exploration of potential solutions. Each of these approaches provided concrete steps to enhance problem-solving skills and produce effective solution implementation. Moreover, the theoretical foundation of each intervention aligned with a *positive problem orientation* that empowered parents to (a) appraise problems as a challenge rather than a threat; (b) optimistically presume that solutions were possible; (c) confidently believe they possessed appropriate self-efficacy skills to effectively solve the problem; and (d) willingly commit to implementation of identified solutions rather than avoidance (D'Zurilla & Nezu, 2010).

2.2.2. Expressive writing (EW)

Developed by Pennebaker and colleagues, EW (also referred to as *written emotional disclosure*) provides a safe and private method for participants to divulge personally traumatic events. The basic paradigm of EW posits that the act of disclosure, allowing an individual to share their thoughts or feelings about a traumatic event in a nonthreatening environment, tends to have a positive therapeutic effect on mental as well as physical health (Pennebaker, 1997). Campbell (2003) tested the effects of EW on parents whose child had been diagnosed with autism within the past year. Participants were instructed to write their deepest thoughts and emotions about their child's diagnosis and the effects on their family. Mothers in the experimental group responded to

writing prompts designed to produce a cathartic expression of strong emotion. These studies hypothesized that EW would provide an easily accessible outlet of emotional expression and, thereby, offer an effective coping mechanism to parents.

2.2.3. Mindfulness training (MT)

Mindfulness is a process of deliberate awareness and nonjudgmental acceptance of thoughts and feelings in the present moment (Bishop et al., 2004), specifically, mental training that enables the individual to reflect upon events as opposed to reacting to them. This process of self-regulation is associated with positive outcomes. Benn and colleagues examined the effects of SMART-in-Education (Stress Management and Relaxation Techniques), a manual-based mindfulness program adapted from Mindfulness-Based Stress Reduction (MBSR) by Kabat-Zinn (1990). SMART included mindfulness mental training exercises aimed at improving emotional awareness and regulating behavioral responses. The content also focused on the application of forgiveness and compassion in parenting practices. Also implementing MBSR, Dykens et al. (2014) tested an intervention that taught parents deep breathing techniques, non-judgmental self-observation, and meditation practices. Ferraioli and Harris (2013) sought to reduce parental stress through training that centered on five core mindfulness components: (a) observing and describing events and personal responses, (b) nonjudgmental acceptance, (c) distancing self from thoughts, (d) staying present, and (e) making effective commitment to maintain mindfulness practices. Participants were encouraged to incorporate these techniques in their daily lives, especially during interactions with their child with ASD. From a mindfulness perspective, action-based solutions to environmental stressors are secondary to self-regulation achieved through introspection and nonjudgmental reflection. MT relieves the parent from the compulsion to solve the problem. Rather, its techniques teach parents to objectively observe and acknowledge difficulties without the necessity to change them.

2.2.4. Positive psychology (PP)

The conceptual framework of PP postulates that individuals want more in life than simply removing their emotional suffering, the typical targets of mental health interventions (Duckworth, Steen, & Seligman, 2005). Seligman (2002) proposed that a "happy" life is one enriched with positive emotion over time, past (contentment), present (somatic pleasures), and future (optimism). Positive psychotherapy teaches individuals to reappraise their unpleasant experiences, focus on more positive aspects of their lives, and achieve overall well-being. LaPlante (2013) sought to improve parental subjective well-being through the implementation of Three Good Things (TGT) intervention, developed by Seligman, Steen, Park, and Peterson (2005). TGT charges participants to find three good things that happened during their day. Dykens et al. (2014) assessed whether Positive Adult Development (PAD) would be effective where parents are taught to identify character strengths through experiential exercises involving gratitude, forgiveness, grace, and optimism. Theoretically, PP does not seek to change the person's circumstances. Rather, the approach guides parents to mentally shift their perspective toward more positive aspects of their difficult life experiences.

2.2.5. Relaxation therapy (RT)

Individuals are trained to contract and release their muscles, while becoming cognizant of the distinction between tension and relaxation in the body. Subsequently, they are directed to apply these techniques to imbue relaxation in daily stressful situations. Gika et al. (2012) tested the efficacy of RT to reduce stress for parents of children with ASD, emphasizing deep breathing and relaxation of specific muscle groups. In so doing, RT offers the potential of immediate relaxation through a delivery of in-the-moment techniques.

2.3. Multi-modal approaches

2.3.1. Acceptance and commitment therapy (ACT)

A blend of MT and CBT, ACT combines nonjudgmental acceptance of negative or uncomfortable emotions with cognitive diffusion to disrupt negative cognitions associated with those emotions (Hayes, 2004). Blackledge and Hayes (2006) posited ACT to be particularly relevant to parents because their child's symptoms of autism are unlikely to rapidly change or dissipate. As such, it is vital that parents are able to accept the sometimes unpleasant emotions and difficult experiences surrounding their child's disorder. Kowalkowski (2013) utilized a manual-based curriculum that targeted mindfulness concepts of acceptance and intentional awareness. In both studies, parents were guided through experiential activities designed to: (1) teach acceptance of undesirable feelings and intense emotions rather than avoidance of them and (2) build awareness of their continuous stream of thoughts without judgmental reaction. Parents were also guided through experiential activities to practice cognitive diffusion in order to weaken the psychological effect of problematic thoughts.

2.3.2. Biofeedback training and relaxation therapy (BFT & RT)

A patient receives visual stimuli of a specific physiological signal, for instance an electrocardiographic (EKG) record of heart activity. BFT occurs when the patient then consciously attempts to self-regulate a targeted somatic or psychosomatic response (Green, Green, & Walters, 1974). Pairing BFT with RT, Bitsika and Sharpley (2000) sought to improve parents' stress management skills with a combination of progressive muscle relaxation, deep abdominal breathing, and guided imagery with biofeedback of heart rate and heart reactivity of stressful events. Parents were encouraged to use these relaxation techniques as strategies to reduce heart rate reactivity, thereby reducing reactivity to parenting stressors.

2.3.3. Family systems therapy (FST) and stress management

An intervention conceptualized with a family systems approach includes all members of the family while taking into consideration subgroups of interactions such as parent-child, sibling-child, and marital relationships (Morgan, 1988). Peck (1998) evaluated an FST intervention for caregivers that consisted of three components: (a) ASD education, (b) improvement in parental self-advocacy and social support, and (c) awareness and reduction of stress. The first component addressed how ASD affects the subgroups within the family. The second component taught methods to improve social support within the family and extend social networks outward to the community. In the third component, parents were taught to understand stress and how it affected them.

2.4. Intervention procedures

2.4.1. Format

A majority of the studies presented intervention sessions in group settings, while only five studies intervened with participants individually (Campbell, 2003; Feinberg et al., 2014; Kenney, 2010; LaPlante, 2013; Whitney & Smith, 2014). Group sessions incorporated either one or a combination of the following presentation formats: lectures, group discussions, guided practice/role playing, and/or experiential activities. Individual interactions were either 1:1 therapy, individual coaching, phone interviews and instructions, or online intervention activities.

2.4.2. Setting

Most intervention activities were conducted at outpatient family clinics (Ferraioli & Harris, 2013; Gika et al., 2012; Kenney, 2010; Kowalkowski, 2013; Peck, 1998). The second most utilized location was the family home or a location of the parents' choosing (Campbell, 2003; Feinberg et al., 2014; Gika et al., 2012). Other intervention locations included ASD school sites (Benn et al., 2012; Bitsika

& Sharpley, 2000), an ASD treatment center (Blackledge & Hayes, 2006), and convenient community locations (Dykens et al., 2014). LaPlante (2013) and Whitney and Smith (2014) were the only studies conducted online.

2.4.3. Therapists or instructors

Trained professionals were the primary presenters of intervention content. Rather than utilizing professionals, Dykens et al. (2014) used peer-mentors, mothers of children with developmental disabilities, to lead group workshops. Three interventions were implemented using a self-administration method: Parents completed intervention activities at home using an instructional CD (Gika et al., 2012) or they received instructions and completed activities online (LaPlante, 2013; Whitney & Smith, 2014).

2.4.4. Intervention duration

Typically, intervention sessions met once per week with the exception of Benn et al. (2012), which held sessions twice per week. Most weekly interventions lasted six (Dykens et al., 2014; Feinberg et al., 2014; Gika et al., 2012) to eight weeks (Bitsika & Sharpley, 2000; Ferraioli & Harris, 2013; Kowalkowski, 2013; Whitney & Smith, 2014), but ranged from five (Benn et al., 2012; Kenney, 2010) to nine weeks (Peck, 1998) in duration. Blackledge and Hayes (2006) delivered an intensive 2-day intervention for seven hours per day. The two writing interventions instructed participants to complete writing tasks over a period of three days for 20 min per day (Campbell, 2003) or for seven days at 10 min per day (LaPlante, 2013). Although Gika and colleagues implemented four coaching sessions over a period of six weeks, participants were instructed to practice relaxation techniques for 20 min, twice per day, for the entire 6-week period.

3. Review of research methodology

The studies included in this review employed (a) randomized controlled trials or (b) quasi-experimental designs (without control groups) (see Table 1). By inclusion criteria, all studies implemented at least a baseline and post-assessment. Eight studies employed a follow-up assessments from one to six months following the conclusion of the intervention.

3.1. Research design

3.1.1. Randomized controlled trials (RCT)

Eight of the 13 reviewed studies used random assignment to place participants into a variety of treatment groups and control conditions. Three types of control groups were implemented, (a) care as usual, (b) wait-list controls, and (c) active controls. Whereas only three studies used either a wait-list control or care as usual (Benn et al., 2012; Feinberg et al., 2014; Whitney & Smith, 2014), the remaining studies used a comparison intervention (active control). For example, Ferraioli and Harris (2013) compared differences between a parent-focused intervention, Mindfulness-Based Parent Training (MBPT), and traditional child-focused training, Skills-Based Parent Training. Kowalkowski (2013) examined differences between a therapist-led intervention (ACT) and a parent-led support group. Dykens et al. (2014) compared the effects of mindfulness training (MBSR) to strategies in positive psychology (PAD). Two writing interventions, (Campbell, 2003; LaPlante, 2013) compared writing about an emotionally traumatic topic to writing on neutral topics as the control condition.

3.1.2. Quasi-experimental design (QED)

Five of the 13 studies used a quasi-experimental design with pre and post within-subject evaluations of the targeted interventions without any control or comparison group. Three of these studies assessed parent outcomes comparing baseline and post-intervention results (Bitsika & Sharpley, 2000; Gika et al., 2012; Peck, 1998). Kenney (2010) used a single-case design with multiple baselines, while Blackledge and Hayes (2006) utilized a within-subject, repeated measures design.

3.1.3. Follow-up assessment

Seven of the 13 studies conducted follow-up assessments within two to three months after the completion of the intervention (Benn et al., 2012; Blackledge & Hayes, 2006; Campbell, 2003; Dykens et al., 2014; Feinberg et al., 2014; Ferraioli & Harris, 2013; and Kowalkowski, 2013). Dykens et al. (2014) was the only reviewed study that assessed outcomes at six months (in addition to two months) following the intervention. Six studies used only an immediate post-assessment (Bitsika & Sharpley, 2000; Gika et al., 2012; Kenney, 2010; LaPlante, 2013; Peck, 1998; and Whitney & Smith, 2014).

3.2. Outcome measurements

This review examined interventions that specifically targeted improvements in mental health for parents of children with ASD. Mental health could be operationalized to include a reduction in pathologic measures of psychological illness (e.g. depression, anxiety, and psychological distress) and/or an increase in psychological well-being (e.g. life satisfaction, self-compassion, and personal growth). With the exception of one scale (Program Evaluation Questionnaire; Bitsika & Sharpley, 2000), all measurement instruments were standardized, reliable, and well-known self-report questionnaires (see Table 2). No study included objective measures, such as clinical interview.

3.2.1. Psychological pathology

Study measures assessing psychological illness pathology clustered into two categories, (a) mental disorder symptomology and (b) stress (reaction to stressor) and distress (negative state). Mental disorder symptomology included measures of anxiety, cognitive distortion, depression, grief, insomnia, and positive/negative affect.

3.2.2. Psychological well-being

Optimal psychological functioning not only requires the achievement of self-acceptance, positive relations with others, and a purpose in life, but also continual personal growth and development of one's fullest potential (Ryff, 1989). In this aim, more of the studies collectively targeted psychological well-being than mental disorder symptomology. Outcomes included (a) coping, (b) family functioning (family climate and parent-child interaction), and (c) personal growth. The latter included acceptance, empathy, forgiveness, gratitude, life satisfaction, mindfulness, parenting self-efficacy, perceived gains through caregiving, personal growth, and self-compassion.

3.3. Sample characteristics

3.3.1. Sample formation

Studies used a variety of recruitment methods and eligibility criteria in the formation of study samples, which are detailed in Table 3. All studies recruited parents or caregivers of children diagnosed with ASD. One study also included parents of children diagnosed with attention-deficit disorder (Benn et al., 2012).

Although some studies included parents with children with a broad age range, other studies imposed eligibility criteria that depended upon the child's age or time of ASD diagnosis. For instance, Peck (1998) and Feinberg et al. (2014) included parents whose children with ASD were less than six years old and Kowalkowski (2013) included children between the ages 2–11 years. Campbell (2003) and Feinberg et al. (2014) enrolled only parents whose children were diagnosed within the past six months since their interventions targeted outcomes that related to a recent diagnosis of ASD. Other eligibility criteria applied, such as English-speakers (Blackledge & Hayes, 2006; Kenney, 2010;

Table 1
Descriptive characteristics of mental health interventions for parents of children with autism spectrum disorders.

Study	Intervention description/setting	Participants	Research design	Parent outcomes/instrument (*for abbreviations see* Table 2)
Randomized Control Trials (RCT)				
Benn et al. (2012)	SMART-in-Education (Stress Management and Relaxation Techniques) program, a manual-based curriculum of mindfulness practices. Format: Cognitive therapist (trained in mindfulness-based cognitive therapy) delivered lectures, group discussion, mindfulness modeling, homework activities, and guided practice for groups and individuals. Setting: ASD school site Duration: 5 weeks (2× week) / 11 sessions (nine 2.5-h sessions, two 6-h sessions)	$n = 60$ Parents: $n = 25$ (Fathers = 2; Mothers = 23) Educators: $n = 35$ (Male = 3; Female = 32) Parent age: $M = 47$ years Educator age: $M = 46$ years Ethnicity: not specified Child age range: 5–23 years	Mindfulness training vs. wait-list control Measurement Points: Baseline, 1-week post-intervention, and 2-month follow-up	Anxiety: STAI Depression: CES-D Empathy: IRI Forgiveness: TFS Mindfulness: FFMQ Parent-child interaction: PSI Parenting self-efficacy: EPS Personal growth: PWBS Positive/negative affect: PANAS Self-compassion: SCS Stress: PSS
Campbell (2003)	Written Emotional Expression, an expressive writing intervention that sought to relieve parental grief surrounding child's diagnosis of ASD. Format: Clinical psychology intern provided instructions on the phone for all intervention procedures. Parents were asked to write about their deepest emotions regarding ASD. Setting: Home or location of mother's choosing Duration: 3 days (20 min per day)	$n = 30$ Parent age: not specified Ethnicity: Caucasian (84%), African American (8%), Asian (8%) Child age: not specified	Expressive writing about emotional vs. control topics on ASD Measurement Points: Baseline and 2-month follow-up	Family climate: FES Grief: GEI Subjective stress: IES
Dykens et al. (2014)	Two interventions were implemented: Mindfulness-Based Stress Reduction (MBSR) and Positive Adult Development (PAD) Format: Peer-mentors, mothers of children with disabilities, implemented group-based interventions aimed at reducing anxiety, depression, and parenting stress. Setting: Community locations Duration: 6 weeks (1.5 h per week)	$n = 243$ Mothers Mothers age: $M = 40$ years Ethnicity: Caucasian (69.6%), African American (14.7%), Hispanic (9.2%), Asian/other (6.5%) Child age range: 2–54 years	Mindfulness training vs. positive psychology Measurement Points: Baseline, mid-treatment, post-intervention and 1, 3, and 6-month follow-up	Anxiety: BAI Depression: BDI Insomnia: ISI Life satisfaction: SWLS Parental distress: PSI Psychological well-being: PWBS
Feinberg et al. (2014)	PSE (Problem-solving Education), a manual-based cognitive behavioral intervention to decrease parenting stress and depressive symptoms. Format: Trained interventionists worked with mothers individually to identify a problem and coach parent through problem-solving steps. Setting: Home or location of mother's choosing Duration: 6 sessions (30–45 min per week)	Intervention $n = 59$ Mothers Mothers age: $M = 32$ years Ethnicity: Caucasian (42%), Hispanic (36%), African American (14%), Asian/other (9%) Control $n = 61$ Mothers Mothers age: $M = 35$ years Ethnicity: African American (33%), Caucasian (31%), Hispanic (28%), Asian/other (10%) Child age: $M = 34$ months	Cognitive behavioral intervention vs. care as usual Measurement Points: Baseline and 3-month follow-up	Coping style: B-COPE Depressive symptoms: QIDS Parenting stress: PSI
Ferraioli and Harris (2013)	Mindfulness-based Parent Training (MBPT), a mindfulness training to alleviate parental stress and enhance parent-child interactions. Format: Clinical psychology intern conducted lectures, group discussions, role plays, and assigned homework activities. Setting: Outpatient family clinic Duration: 8 weeks (2 h per week)	$n = 15$ (Fathers = 5; Mothers = 10) Parent age: not specified Ethnicity: Caucasian (33%), Indian (27%), Asian (13%), Hispanic (13%), African American (7%), Other (7%) Child age range: 3 years to adult	Parent-focused mindfulness vs. child-focused behavioral skills Measurement Points: Baseline, post-intervention, and 3-month follow-up	General health (somatic symptoms, social dysfunction, anxiety/insomnia, and depression): GHQ Mindfulness: MAAS Parenting stress: PSI
Kowalkowski (2013)	Acceptance and Commitment Therapy (ACT), a group-based treatment addressing the acceptance of unpleasant thoughts and feelings. Format: Clinical psychology intern delivered intervention sessions on coping, identifying emotions, mindfulness, and guided experiential activities in a group format. Setting: Outpatient family clinic Duration: 8 weeks (90 min per week)	Intervention $n = 13$ Mothers Parent age range: 40–49 years Control $n = 4$ Mothers Parent age range: 30–39 years Ethnicity: Caucasian (76.5%), African American (11.8%), Hispanic (11.8%) Child age range: 4–11 years	ACT treatment vs. participant-led support group Measurement Points: 3-week pre, 1-week post, and 3-month follow-up	Acceptance: AAQ Depression: ATQ Mindfulness: FFMQ Parenting stress: PSI Perceived gains: PAC Psychological distress: BSI-18
LaPlante (2013)	TGT (Three Good Things), a positive psychology intervention to improve parental well-being. Format: An online delivery method instructed parents to keep a daily journal of three good things that happened during the day and explain why they happened.	Intervention $n = 108$ (Fathers = 6; Mothers = 102) Ethnicity: Caucasian (80.6%), African American (5.6%), Multiracial (5.6%), Hispanic (4.6%), American Indian (1.9%), Asian American/Pacific Islander (0.9%), Other (0.9%)	TGT intervention vs. neutral writing task Measurement Points: Baseline and post-intervention	Depressive symptoms: CES-D Gratitude: GQ-6 Life satisfaction: SWLS Parenting self-efficacy: PSOC Positive/negative affect: PANAS

Table 1 (*continued*)

Study	Intervention description/setting	Participants	Research design	Parent outcomes/instrument (*for abbreviations see* Table 2)
	Setting: Online measurements and intervention at home/parent location Duration: 7 days	Control $n = 104$ (Fathers = 5; Mothers = 98; missing = 1) Ethnicity: Caucasian (80.8%), African American (5.8%), Hispanic (5.8%), Multiracial (3.8%), Other (2.9%), missing (1%) Parent age: not specified Child age: not specified		
Whitney and Smith (2014)	Emotional disclosure intervention to reduce maternal stress levels. Format: An online journal writing intervention instructed mothers to respond to weekly writing prompts intended to help them express strong emotions. Setting: Online measurements and intervention at home/parent location Duration: 8 weeks (15 min writing per week)	$n = 120$ Mothers Mothers age: $M = 41$ years Ethnicity: Caucasian (91%), Other, not specified (9%) Child age range: 3–18 years Intervention $n = 56$ Mothers Control $n = 64$ Mothers	Expressive writing about emotional topics on ASD vs. wait-list control Measurement Points: Baseline and post-intervention	Maternal stress: PSI-SF
Quasi-Experimental Design (QED): Pre/Post Evaluations				
Bitsika and Sharpley (2000)	Stress management program to help parents reduce anxiety and depression. Mothers learned coping skills and biofeedback techniques, e.g. muscle relaxation, guided imagery, and deep breathing. Format: Clinical psychologist and special education classroom teacher lead support and practical skills groups. Setting: ASD school site Duration: 8 weeks (75 min per week)	$n = 11$ Mothers Mother age: $M = 37$ years Ethnicity: not specified Child age: not specified	Pre/post evaluation of maternal stress management training Measurement Points: Baseline and post-intervention	Anxiety: SAS Depression: SDS Parenting self-efficacy: PEQ
Blackledge and Hayes (2006)	Acceptance and Commitment Therapy (ACT) to train participants in acceptance of difficult emotions and cognitions. Format: Clinical psychologist facilitated workshops of interactive and experiential group exercises. Setting: ASD treatment centers Duration: 2 days (7 h per day)	$n = 20$ (Fathers = 5; Mothers = 15) Parent age: $M = 43$ years Ethnicity: Caucasian (60%), Hispanic (30%), Asian/Pacific Islander (10%) Child age: not specified	Within-subject, repeated measures design evaluating exposure to ACT workshops Measurement Points: 3-weeks pre, 1-week pre, 1-week post, 3-month Follow-up	Acceptance: AAQ Depression: ATQ, BDI General health: GHQ Psychological distress: GSI
Gika et al. (2012)	Relaxation training to reduce stress through breathing and muscle relaxation techniques. Format: Interventionists trained Mothers on relaxation techniques in a group session, then gave CD of relaxation instructions to Moms to take home and complete daily exercises. Setting: Home or outpatient family clinic Duration: 6 weeks (with home practice 2× daily - 20 min per day)	$n = 11$ Mothers Parent age: $M = 44$ years Ethnicity: not specified Child age range: 4.5–17 years	Pre/post evaluation of relaxation training Measurement Points: Baseline and post-intervention	Parental stress: PSI Perceived stress: PSS
Peck (1998)	Family systems theory-based intervention that combined elements of parent training and behavioral therapy. Format: Psychologist lead group sessions that taught parents about autism and how it affects the family system, methods of increasing social support, and methods of stress management and stress reduction. Setting: Outpatient family clinic Duration: 9 weeks (2 h per week)	$n = 9$ Parents Parent age: not specified Ethnicity: not specified Child age: preschool	Pre-post evaluation of psycho-educational intervention Measurement Points: Baseline and post-intervention	Parenting stress: PSI Caregiver stress (specifically for families caring for a disabled relative): QRS
Quasi-Experimental Design (QED): Single-case studies				
Kenney (2010)	Solution focused brief therapy (SFBT), a cognitive therapy intervention to reduce cognitive distortion and parental stress. Format: SFBT trained therapists implemented intervention to parents individually. Participants were guided to identify problems and explore potential solutions. Setting: Outpatient family clinic Duration: 5 weeks (1 h per week)	$n = 3$ Mothers Parent age: $M = 42$ years Ethnicity: Caucasian (67%), Hispanic (33%) Child age: $M = 7$ years	Single-case design with multiple baseline evaluation of solution-focused cognitive therapy intervention Measurement Points: Baseline, post-intervention, and 1-month follow-up	Cognitive distortion (helplessness, hopelessness, self-blame, self-criticism, and preoccupation with danger): CDS Parenting stress: PSI

Kowalkowski, 2013), enrollment in a specific ASD school (Bitsika & Sharpley, 2000), or mothers only (Feinberg et al., 2014; Gika et al., 2012, Kowalkowski, 2013).

Recruitment methods ranged from informational announcements made in intimate settings, such as a parent group meeting (Bitsika & Sharpley, 2000), to website announcements or electronic notifications

Table 2
Measurement instruments used to assess mental health outcomes for parents of children with autism spectrum disorders.

Psychological illness	Instrument (Abbreviation)	Study
Mental disorder symptomology		
Anxiety	Beck Anxiety Inventory (BAI) (Beck & Steer, 1990)	Dykens et al. (2014)
	Self-Rating Anxiety Scale (SAS) (Zung, 1971)	Bitsika and Sharpley (2000)
	State-Trait Anxiety Inventory for Adults (STAI) (Kendall, Finch, Auerbach, Hooke, & Mikulka, 1976)	Benn et al. (2012)
Cognitive distortion	Cognitive Distortion Scale (CDS) (Briere, 2000)	Kenney (2010)
Depression	Automatic Thoughts Questionnaire (ATQ) (Hollon & Kendall, 1980)	Blackledge and Hayes (2006), Kowalkowski (2013)
	Beck Depression Inventory-II (BDI) (Beck, Steer, & Brown, 1996)	Blackledge and Hayes (2006), Dykens et al. (2014)
	Center for Epidemiological Studies Depression Scale (CES-D) (Radloff, 1977)	Benn et al. (2012)
	Quick Inventory of Depressive Symptomatology (QIDS) (Rush et al., 2003)	LaPlante (2013), Feinberg et al. (2014)
	Self-Rating Depression Scale (SDS) (Zung, 1965)	Bitsika and Sharpley (2000)
General health	General Health Questionnaire (somatic symptoms, social dysfunction, anxiety/insomnia, depression) (GHQ) (Goldberg, 1978)	Blackledge and Hayes (2006), Ferraioli and Harris (2013)
Grief	Grief Experience Inventory (GEI) (Sanders, Mauger, & Strong, 1985)	Campbell (2003)
Insomnia	Insomnia Severity Index (ISI) (Bastien, Vallières, & Morin, 2001)	Dykens et al. (2014)
Negative/positive affect	Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988)	Benn et al. (2012), LaPlante (2013)
Stress and distress		
Caregiver stress	Questionnaire on Resources and Stress for Families with Chronically Ill or Handicapped Members (QRS) (Holroyd, 1974)	Peck (1998)
Parental distress	Parenting Stress Index (PSI) (Abidin, 1983)	Dykens et al. (2014), Feinberg et al. (2014), Ferraioli and Harris (2013), Gika et al. (2012), Kenney (2010), Kowalkowski (2013), Peck (1998), Whitney and Smith (2014)
Perceived stress	Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983)	Benn et al. (2012), Gika et al. (2012)
Psychological distress	Brief Symptom Inventory-18 (BSI-18) (Derogatis, 2001)	Kowalkowski (2013)
	Global Severity Index (GSI) (Derogatis & Melisaratos, 1983)	Blackledge and Hayes (2006)
Subjective stress	Impact of Events Scale (IES) (Horowitz, Wilner, & Alvarez, 1979)	Campbell (2003)
Coping		
Coping	Brief Coping Orientation to Problems (B-COPE) (Carver, 1997)	Feinberg et al. (2014)
Family functioning		
Family climate	Family Environment Scale (FES) (Moos & Moos, 1994)	Campbell (2003)
Parent-child interaction	Parenting Stress Index (parent-child interaction subscale) (PSI) (Abidin, 1983)	Benn et al. (2012)
Personal growth		
Acceptance	Acceptance and Action Questionnaire (AAQ) (Strosahl et al., 2004)	Blackledge and Hayes (2006), Kowalkowski (2013)
Empathy	Interpersonal Reactivity Index (IRI) (Davis, 1983)	Benn et al. (2012)
Forgiveness	Tendency to Forgive Scale (TFS) (Brown & Phillips, 2005)	Benn et al. (2012)
Gratitude	Gratitude Questionnaire-6 (GQ-6) (McCullough, Emmons, & Tsang, 2002)	LaPlante (2013)
Life satisfaction	Satisfaction with Life Scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985)	Dykens et al. (2014), LaPlante (2013)
Mindfulness	Five Facet Mindfulness Questionnaire (FFMQ) (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006)	Benn et al. (2012), Kowalkowski (2013)
	Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003)	Ferraioli and Harris (2013)
Parenting self-efficacy	Everyday Parenting Scale (EPS) (Dunst & Masiello, 2002)	Benn et al. (2012)
	Parenting Sense of Competence (PSOC) (Gibaud-Wallston & Wandersmann, 1978)	LaPlante (2013)
	Program Evaluation Questionnaire (PEQ) (Bitsika & Sharpley, 2000)	Bitsika and Sharpley (2000)
Perceived gains	Positive Aspects of Caregiving (PAC) (Tarlow et al., 2004)	Kowalkowski (2013)
Personal growth	Psychological Well-Being Scale (PWBS) (Ryff & Keyes, 1995)	Benn et al. (2012)
Psychological well-being	Psychological Well-Being Scale (PWBS) (Ryff & Keyes, 1995)	Dykens et al. (2014)
Self-compassion	Self-Compassion Scale (SCS) (Neff, 2003)	Benn et al. (2012)

made by national ASD organizations (LaPlante, 2013). The method of recruitment did not always predict sample size. For example, three studies advertised through state-wide disability organizations that reached a considerable number of potential participants, yet samples sizes were vastly different. While Dykens et al. (2014) managed to enroll 243 participants, Ferraioli and Harris (2013) enrolled 15 and Kenney (2010) only enrolled three.

With the exception of four studies, all parents were offered incentives from a $5 gift card to a $100 gift card. In contrast, Dykens et al. (2014) provided childcare to participants' children with ASD and their siblings during intervention sessions. Considering that some studies noted lack of childcare as a participation barrier (e.g. Ferraioli & Harris, 2013), quite possibly, this may have been an attractive incentive which helped to bolster study participation.

Expressive writing generally produces short-term distress in experimental participants following completion of the treatment and salutary health effects occurring only over time (Smyth, 1998). Therefore, not surprisingly when EW was only evaluated at post-intervention, the treatment group reported significantly higher parenting stress ($d = -1.60$; Whitney & Smith, 2014) compared to the control. Not including a follow-up assessment several months later, this study was unable to detect changes that may have occurred over time.

3.3.2. Participant characteristics

Characteristics of participants are detailed in Table 1. In summary, female participants widely outnumbered male participants. This is not surprising considering mothers of children with ASD typically take on the role of primary caregiver (Phetrasuwan & Shandor Miles, 2009), and thereby, experience more psychological distress (Boyd, 2002; Hastings et al., 2005). In studies that reported age, the range of parents' mean age was 32 to 49 years and children's ages ranged from 24 months to over 18 years.

On the whole, each study made a considerable effort to recruit a representative sample of racial and ethnic groups based on their geographical surroundings. Study populations consisted of African American ($M = 10\%$), Asian ($M = 6\%$), Caucasian ($M = 63\%$), Hispanic ($M =$

Table 3
Study sample formation methods.

Study	Eligibility criteria	Recruitment method	Participation incentives
Benn et al. (2012)	Parents of children with special needs (includes ASD, attention-deficit/learning disability, cognitive/health impairment)	Parents recruited through special education service offices in one school district	$25 per assessment (×3)
Bitsika and Sharpley (2000)	Parents of children with ASD who attended the same school	Informational meeting about the study given to parents at one autism-specific school	None listed
Blackledge and Hayes (2006)	English-speaking parents of children with ASD	Intervention descriptions and invitation to participate mailed to parents in 3 different geographical areas	None listed
Campbell (2003)	Parents of children diagnosed with ASD within the past year	Parents recruited through Autism Society of America (ASA) support groups; early intervention program facilities; conference teaching children with ASD	$10 donation to ASA chapter of parent's choice
Dykens et al. (2014)	Primary caregiver of children with developmental disabilities (including ASD) with no previous training in the intervention topics and willing to be randomized into groups	Study advertised through web sites and announcements to local and state disability organizations	On-site child care for children and siblings
Feinberg et al. (2014)	English- or Spanish-speaking mothers of child recently diagnosed with ASD and younger than 6 years old	Parents recruited from autism clinic and six early intervention programs for children birth to 3 years	$25 gift card for assessment completion; $100 gift card for intervention completion
Ferraioli and Harris (2013)	Primary caregiver of children with ASD younger than 18 years old	Study advertised in the newsletter of a statewide autism agency and a state University Developmental Disability center	$50 upon study completion
Gika et al. (2012)	Mothers of children with ASD	Parents recruited from autism clinic at a University Child Psychiatric Department hospital	None listed
Kenney (2010)	English-speaking parents of children with ASD	Parents recruited through posted flyers and website announcements of local state and county Autism Societies	$5 gift card to Starbucks
Kowalkowski (2013)	English-speaking primary caregiver (biological or adoptive) of children with ASD between 2 and 11 years of age Individuals excluded if currently involved in a clinical trial or major medical issue	Parents recruited through direct referrals from local ASD community agencies, hospitals, and schools	$10 gift card per assessment (× 3)
LaPlante (2013)	Parents of children with ASD	Parents recruited through direct distribution and emailed flyers sent by national service providers and support groups (e.g. Autism Speaks)	$15 upon study completion
Peck (1998)	Parents of children with developmental disabilities (including ASD) between 2 and 6 years old	Parents recruited through a developmental clinic and public schools	None listed
Whitney and Smith (2014)	Mothers of children between 3 and 18 years of age who self-identify as having a child hard to parent due to multiple diagnoses (including ASD and ADHD, to name a few)	Study posted a letter of invitation to various online parent support groups	Incentives given (not specified)

17%), and Multi-Cultural ($M = 2\%$) participants. Native American and (not specified) Indian racial groups were underrepresented in study samples.

4. Analysis of treatment effect

As noted, studies consisted of RCTs and QEDs, which displayed a range of results. However, some of the interventions were unable to demonstrate significant improvement in targeted outcomes. Because quasi-experimental designs do not adequately control for extraneous variables and alternate explanations of the treatment effect (Harris et al., 2006), resultant effect sizes might be overestimated (Shadish & Baldwin, 2003). Therefore, an analysis of treatment effect will examine results for RCTs and QEDs separately. To evaluate treatment effects across RCTs, we computed effect sizes (Shadish, Robinson, & Lu, 1999). Table 4 depicts either reported or calculated effect sizes from the RCTs within this review. Cohen (1977) defines a small effect as $d \leq 0.20$, a medium or moderate effect as around $d = 0.50$, and a large effect as $d \geq 0.80$. Results of significance testing for QEDs are shown in Table 5.

4.1. Results: RCTs

On average, the treatments outperformed the control conditions across modalities and across time. Six interventions produced a medium effect size across most outcome measures post intervention, suggesting at least based on a single study in each case, a reasonable likelihood of efficacy (Benn et al., 2012; Campbell, 2003; Dykens et al., 2014; Feinberg et al., 2014; Ferraioli & Harris, 2013; Kowalkowski, 2013). Mindfulness treatments demonstrated large effects with parents showing significant improvement in parenting stress ($d = 1.59$; Ferraioli & Harris, 2013), general health (including anxiety, insomnia, and depression) ($d = 1.30$; Ferraioli & Harris, 2013), and parental distress ($d = 0.87$; Dykens et al., 2014). EW demonstrated large effects on subjective stress ($d = 0.94$; Campbell, 2003) and ACT resulted in significantly large reductions in depression ($d = 0.93$; Kowalkowski, 2013) and parenting stress ($d = 0.97$; Kowalkowski, 2013). Mindfulness treatments also demonstrated follow-up improvements of a medium magnitude (Benn et al., 2012) in anxiety ($d = 0.75$) and stress ($d = 0.79$) and a large magnitude in general health ($d = 1.54$; Ferraioli & Harris, 2013). These results point to MT as a promising treatment for parents caring for a child with ASD.

On the contrary, treatment outcomes for the positive psychology intervention (LaPlante, 2013) resulted in small effects ranging from $d = 0.09$ to 0.17. Assuming homogeneity of participants randomly assigned into treatment conditions, the range of treatment outcomes should follow a normal distribution (Shadish & Haddock, 2009). The results presented here suggest such a normative curve including extremely high and low effect size values. Upon closer inspection, however, treatments with extreme values were vastly different in sample size. At post-intervention, the mindfulness interventions had a relatively small sample size with <20 participants. This may have contributed to greater heterogeneity between treatment and control conditions resulting in larger group differences and larger effect sizes. On the contrary, LaPlante (2013) had a sample size ten times as large ($n = 212$) but with a small treatment effect indicated by minimal differences between treatment and control group means. The author reported that within-subject variance across time changed in the direction of the study hypothesis. Specifically, post-intervention participants reported slight reductions in depression and negative affect and increased feelings of gratitude, life satisfaction, and positive affect.

Table 4
Effect sizes for randomized control trials.

Study	Measure	*d* Post	2–3 month follow-up	6-month follow-up
Benn et al. (2012)	Anxiety	*0.52*	*0.75*	
Stress Management	Depression	*0.51*	*0.27*	
and Relaxation	Mindfulness	*0.52*	*0.57*	
Techniques	Personal growth	*0.48*	*0.64*	
	Self-compassion	*0.40*	*0.37*	
	Stress	*0.40*	*0.79*	
Campbell (2003)[a]	Family climate		*0.39*	
Expressive Writing	Grief		*0.63*	
	Subjective stress		**0.94**	
Dykens et al. (2014)[a]	Anxiety			*0.55*
Mindfulness-Based	Depression			*0.44*
Stress	Insomnia			*0.46*
Reduction	Life satisfaction			*0.46*
	Parental distress			**0.87**
	Psychological well-being			*0.46*
Feinberg et al. (2014)[a]	Coping		*0.21*	
Problem Solving	Depression		*0.53*	
Education	Parenting stress		*0.38*	
Ferraioli and Harris	General health	**1.30**	**1.54**	
(2013)	Parenting stress	**1.59**	*0.63*	
Mindfulness-Based				
Parent Training				
Kowalkowski (2013)[a]	Acceptance	*0.46*	*0.46*	
Acceptance and	Depression	**0.93**	*0.75*	
Commitment	Mindfulness	*0.65*	*0.43*	
Therapy	Parenting stress	**0.97**	*0.37*	
	Perceived gains	*0.79*	0.18	
	Psychological distress	*0.56*	*0.41*	
LaPlante (2013)[a]	Depression	0.17		
Three Good Things	Gratitude	0.09		
	Life satisfaction	0.16		
	Negative affect	0.17		
	Parenting self-efficacy	0.15		
	Positive affect	0.13		
Whitney and Smith (2014)[a]	Parenting stress	**-1.60**		
Expressive Writing				

Note. Effect sizes for outcome measurements are either reported in article or calculated based on reported data. Levels of effect sizes are indicated as follows: small effect ($d \leq 0.20$), *medium effect* ($0.21 \leq d \leq 0.79$) (italicized), and large effect ($d \geq 0.80$) (bold print).

[a] Effect sizes were not reported in the article text. Author needed to compute using Shadish et al. (1999) effect size calculator.

Only one study assessed treatment effects past two-three months follow-up. Dykens et al. (2014) reported generally medium effects sizes at six months follow-up for outcomes due to mindfulness-based stress reduction. Parents reported reductions in anxiety ($d = 0.55$), depression ($d = 0.44$), insomnia ($d = 0.46$), and parental distress ($d = 0.87$), and an increase in life satisfaction ($d = 0.46$) and psychological well-being ($d = 0.46$). However, these results were based on only 39% of participants because of high (61%) attrition, raising concerns about this follow-up sample being biased in favor of positive outcomes. Therefore, it is yet unknown whether any parent-focused intervention has lasting positive effects. Several interventions, however, appear promising producing medium to large positive effects that remain two- to three-months after completion: Stress Management and Relaxation Techniques (Benn et al., 2012), Expressive Writing (Campbell, 2003), Mindfulness-Based Stress Reduction (Dykens et al., 2014), Problem Solving Education (Feinberg et al., 2014), Mindfulness-Based Parent Training (Ferraioli & Harris, 2013), and Acceptance and Commitment Therapy (Kowalkowski, 2013).

Table 5
Quasi-experimental post-intervention study results.

Study	Treatment modality	Measure	*p*
Bitsika and Sharpley	Biofeedback and	Anxiety	0.24
(2000)	Relaxation Training	Depression	0.19
		Parenting self-efficacy	0.19
Blackledge and Hayes	Acceptance and	Acceptance	**0.04**
(2006)	Commitment Therapy	Depression	**0.01**
		Psychological distress	**0.02**
Gika et al. (2012)	Relaxation Training	Parental stress	**0.00**
		Perceived stress	**0.00**
Peck (1998)	Family Systems	Parenting stress	*ns*
	Therapy	Caregiver stress	*ns*

Note. Results assessed at baseline and immediately following last intervention session. Excluded are results for the single-subject design (Kenney, 2010). Significant results in bold print. ns = nonsignificant *p*-value.

4.2. Results: QEDs

As shown in Table 5, parents in the ACT treatment reported post-intervention improvements in acceptance ($p = 0.04$), depression ($p = 0.01$), and psychological distress ($p = 0.02$) (Blackledge & Hayes, 2006). Likewise, relaxation training demonstrated significant reductions in parental stress and perceived stress ($p = 0.003$) post-intervention (Gika et al., 2012). Biofeedback training and relaxation therapy results were non-significant for anxiety ($p = 0.24$), depression ($p = 0.19$), and parenting self-efficacy ($p = 0.19$) (Bitsika & Sharpley, 2000). Family systems therapy also reported non-significant findings on parenting stress (Peck, 1998).

Overall, biofeedback training and family systems therapy were unable to influence parent mental health outcomes. However, ACT and relaxation training were equally effective at increasing positive outcomes, like psychological well-being and life satisfaction, and decreasing negative consequences, such as depression and parental stress.

5. Results by intervention characteristics

A review of intervention characteristics combined with study results might reveal important factors that may have influenced treatment effects. However, it needs to be noted that such a summary is limited due to the variety of study designs (RCTs and QEDs) and distinctions between post-intervention effects and follow-up effects. With these limitations in mind, the following offers a summary of treatment effects within the context of intervention characteristics. Care should be given to definitive generalizations.

5.1. Intervention procedure

An examination of instructional format or setting might identify best practices for intervention procedures targeting mental health of parents caring for children with ASD. Characteristics to consider include: (1) group sessions versus individual coaching or therapy, (2) implementation by professional therapist or interventionist versus peer or self-directed intervention, and (3) clinic or school versus home or community settings. Comparatively, there was not a large difference in reported outcomes for group presentation versus individual, nor professionally-led versus peer or self-directed interventions. When considering intervention setting, 80% of interventions (4 of 5 studies) presented in homes or community locations were successful at reducing subjective stress (Campbell, 2003), depression and parenting stress (Feinberg et al., 2014; Gika et al., 2012), and improving life satisfaction and parenting self-efficacy (LaPlante, 2013).

5.2. Follow-up assessment points

Regardless of treatment modality or intervention procedure, a greater number of treatment effects were detected after longer follow-up time points. In some cases, the time period of follow-up made the difference between significant and non-significant results. An illustrative example occurred when examining results for Blackledge and Hayes (2006) and Kowalkowski (2013). Both studies tested acceptance and

commitment therapy, which were implemented in a group led by professionals at a clinic setting. Both studies also assessed outcomes at post-test and at 3-months follow-up. From baseline to post-test, results in parenting stress and psychological distress were non-significant for both studies. However, from baseline to the 3-month follow-up period, outcomes improved and showed a significant treatment effect.

Likewise, Both Dykens et al. (2014) and LaPlante (2013) tested positive psychology interventions presented in home or community locations by peers or self-directed implementation. Although LaPlante did not find any significant results for targeted outcomes, Dykens et al. (2014) reported significant treatment effects in several, including anxiety, depression, and life satisfaction. Notably, LaPlante (2013) only assessed outcomes at baseline and 1-week post-intervention, whereas Dykens et al. (2014) administered assessments at baseline and 6-month follow-up. Additionally, Bitsika and Sharpley (2000) and Peck (1998) only measured assessments at baseline and post-intervention, immediately following the last intervention session. Here again, utilizing a short-term follow-up period, both studies were unable to show significant effects of their tested intervention.

Hence, studies that reported significant mental health results assessed outcomes at least two months post-intervention. Moreover, studies that assessed outcomes at multiple follow-up points reported a larger magnitude of change at later assessment points, such as three or six months (Dykens et al., 2014; Feinberg et al., 2014; Ferraioli & Harris, 2013; Kowalkowski, 2013). Quite possibly, this implies that transformations in mental health require more time before positive effects become apparent.

6. Critique of research and recommendations

The studies presented in this review encompass a promising body of research on mental health interventions for parents of children with ASD. Although a small number of studies in total, several interventions significantly reduced deleterious and improved salutary outcomes for parents who, on average, experienced high baseline distress. Nonetheless, this body of research contains significant limitations in need of improvement for this field to move forward.

6.1. Research design

Typically, RCTs are considered the gold standard for testing intervention efficacy (Shadish, Cook, & Campbell, 2002). Quasi-experimental designs provide limited information about treatment effectiveness due to lack of control for alternative explanations. Table 6 depicts parent attrition rates in studies using both designs across assessment time points. On average, RCTs lost 30% of participants at post-intervention, whereas, QEDs only lost an average of 11%. An examination of control-group conditions reveals possible explanations of RCT attrition within the reviewed studies.

For example, Kowalkowski (2013) used an RCT design to test the efficacy of an intervention led by a professional therapist versus an active control peer-lead support group. Although the proposed intervention duration was eight weeks, the entire control group withdrew after only three weeks of participation. They cited dissatisfaction with peer-to-peer support and a need for more formalized guidance from a trained professional on topics of coping with stress. Feinberg et al. (2014) compared care as usual to a CBT. In this case, usual care consisted of services provided in the child's Individualized Family Service Plan or Individualized Educational Plan (i.e. speech services, occupational therapy, assistive technology, etc.), which did not include mental health care for the parent. Benn et al. (2012) utilized a wait-list control in comparison to stress reduction and relaxation therapy, and noted that treatment and control group participants did not differ significantly at baseline. However, an analysis of parents who did not complete follow-up assessments indicated a higher baseline rate of depression, stress, and anxiety, which is common among participants who drop out of mental health interventions (Kazdin, 1990).

Dykens et al. (2014) chose not to use an inactive control condition by testing a two-arm intervention of mindfulness versus positive psychology. At post-intervention, the study only lost 17% of 243 participants. Thus, when considering research design to test interventions for parents of children with ASD, active comparison conditions may reduce attrition when utilizing RCTs.

6.2. Reporting effect sizes

Further, of the eight RCTs, only two reported effects sizes across all assessment times. For the remaining six studies, these needed to be calculated from available information. As research on mental health interventions for parents of children with ASD increases, future researchers need routinely to report effect sizes for all outcomes.

6.3. Outcome measurement

All studies relied solely on self-report instruments to assess outcome. Many acknowledged this as a study limitation. Future investigations should add objective measurements, such as bio-markers of stress and other physical measures, which can provide correlational comparison with self-reported responses. As well, observational measures, clinical interview, and report from other sources, such as a spouse, would achieve desirable multimodal assessment of outcomes and strengthen reporting of positive results.

Table 6
Attrition rates of parents of children with autism spectrum disorders from post-intervention to follow-up.

Randomized controlled trials	*n*	Post	1 month follow-up	2–3 month follow-up	6 month follow-up
Benn et al. (2012)	70	26%	–	39%	–
Campbell (2003)	30	–	–	17%	–
Dykens et al. (2014)	243	17%	43%	62%	61%
Feinberg et al. (2014)	122	–	–	11%	–
Ferraioli and Harris (2013)	21	–	–	29%	–
Kowalkowski (2013)	25	32%	–	32%	–
LaPlante (2013)	212	45%	–	–	–
Whitney and Smith (2014)	120	15%			
Average		**27%**		**31%**	

Quasi-experimental design	*n*	Post	3 month follow-up
Bitsika and Sharpley (2000)	11	0%	–
Blackledge and Hayes (2006)	20	15%	15%
Gika et al. (2012)	11	0%	–
Kenney (2010)	3	0%	–
Peck (1998)	19	42%	–
Average		**11%**	

6.4. Sample formation

Investigators used several recruitment methods to enroll a sample representative of the general population, as detailed in Table 3. However, in some cases selection bias occurred. For example, Campbell (2003) noted a low response rate to study recruitment for the EW intervention. Those who responded were a more motivated group of married Caucasian mothers of a certain education level. Kenney (2010) and Kowalkowski (2013) also noted homogeneity of participants. Characteristically, they were English-speaking females, ages 39 to 42 years, married, stay at home mothers, with time and means to complete research sessions. In addition, participant characteristics as depicted in Table 1 illustrate the under-representation of ethnic minorities such as African-Americans, Asians, and Native Americans.

In addition, participant mental health issues may have played a major role in enrollment and intervention adherence. Most studies found high baseline levels of stress, anxiety, and depression for parents caring for a child with ASD. Quite possibly, participants experiencing mental health issues self-selected into the study as a means to address their psychological needs. However, participants with higher baseline levels of stress and depression were more likely to drop out of intervention and less likely to complete follow-up measures (Benn et al., 2012).

6.5. Generalizability of results

Many studies reported low sample size as a major limitation to generalizability. Bitsika and Sharpley (2000) noted a limitation in performing several statistical tests due to small sample sizes. Small sample sizes affected the formation of control conditions and an examination of between group effects. For example, Kowalkowski (2013) lost a control group mid-study, necessitating a revision from between to within subject comparisons.

Many studies were over-represented by Caucasian female participants over 30 years old. Generalizing to a more diverse sample may prove difficult. For example, results may not apply to male parents as few participated. Likewise, older parents typically report greater life satisfaction (Kenney, 2010). Thus, results may not generalize to younger parents of 30 years or less. Further, disparities in the report of mental illness and access to mental health services is significantly associated with racial and ethnic group membership (Sue, 1992). Thus, it is not clear whether an ethnically heterogeneous group might experience similar effects of treatment compared to Caucasian female study participants. Inferences should be made with caution when considering treatment effect in the context of a multi-cultural, multi-generational, gender-inclusive population. None of the studies examined treatment effects within these subgroups.

6.6. Intervention fidelity and process

Investigators were generally diligent about administering process measurements, video-taping sessions and conducting direct observations to encourage treatment fidelity. It would also be useful to provide evidence that the process hypothesized to be affected by the intervention actually changed and can be linked to changes in mental health. No study in this area tested hypothesized intervention process.

6.7. Replication

A major limitation is the lack of independent replication of any of the interventions that has shown promise. Thus far, each specific intervention has only been examined in a single study. Without replication, the interventions with positive outcomes can only be considered promising, providing preliminary support that they can be efficacious. Widespread application of any of these interventions unfortunately must be considered premature without replication of positive findings.

7. Discussion

The increasing rates of autism has created a subgroup of parents who experience unique challenges resulting in a variety of negative psychological outcomes, such as elevated levels of depression, anxiety, and parental distress. Researchers have begun to focus on improving the parental psychological health. However, because of the small number of studies, the even smaller number of RCTs, and the lack of replication, existing data on interventions to address mental health needs of parents of children with ASD cannot yet support definitive conclusions. Nonetheless, we hypothesize several implications that might be useful to consider.

When examining the specific aims of these treatments, two distinct approaches emerge: (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. Considering the life-long impairment of ASD and the continuous challenges that parents might face, it seems probable that parents would respond better to self-improvement methods that relinquish the need to change their emotions, but rather, help them remain cognizant of their feelings in a nonjudgmental and accepting manner. However, study results do not indicate such a clear delineation. Research (RCTs) that focused solely on active reductions of stress or depression reported similar medium to large effect sizes as those that included self-improvement outcomes. Further research is needed.

Moreover, when examining attrition rates, studies that sought to increase measures of personal growth (i.e. acceptance, mindfulness, gratitude, and life satisfaction) lost a higher percentage of participants at post-intervention than those that only targeted symptom reduction. This might suggest that parents remained engaged longer with treatments that directly targeted their symptoms of discomfort rather than interventions that only intended to change their outlook or perspective on difficult situations. These deductions are marginal at best, given that there are only eight RCTs within this review. Future research could investigate whether treatment effect and attrition rates are influenced by target outcomes that either decrease maladaptive symptoms or improve adaptive perspectives.

As evidenced in the literature, a lack of social support is a powerful predictor of parent psychological dysfunction (Boyd, 2002). Thus, we hypothesized that interventions implemented in a group format would result in the most favorable outcomes. However, this conclusion is not yet supported. Both implementation formats, support groups and individual sessions, appear equally effective at attenuating negative outcomes. For example, at two-month follow-up, Benn et al. (2012) reported medium-to-large effect size for stress reduction ($d = 0.79$) after implementing group sessions at an ASD school site. At three-month follow-up, Feinberg et al. (2014) also reported medium effect size for stress reduction ($d = 0.38$), but sessions were individual and implemented in the home setting. Because the proposed hypothesis cannot be confirmed based on this indirect comparison, this issue will benefit from further research.

Additionally, previous research indicated that poorer mental health status predicted superior response to psychotherapeutic interventions (Sotsky et al., 1991). However, in the case of RCTs, this observation does not consider harmful effects that might result in control group participants whose deleterious mental health conditions are left unaddressed. In cases of care-as-usual, parents only received services as identified in the child's Individualized Educational Plan (Feinberg et al., 2014). While the plan offers many child-focused services, such as speech therapy, occupational therapy, behavioral intervention, and specialized instruction, it does not offer mental health services for the parent. In addition, studies that provided wait-list controls were unable to address parents' immediate needs. In some cases, a substantial number of control group participants were lost to attrition. Although a small

number of studies can yet confirm, it appears that control group participants were at a disadvantage. Future RCTs that target parents of children with ASD might benefit using a research design with a two-arm active intervention.

An examination of assessment time points revealed non-significant or weaker effects at post-test in comparison to follow-up evaluations at least two months and beyond. Mental health outcomes appeared stronger over time. This suggests that targeted competences may need time to become useful and effective. Again, due to the small number of studies within this review, these conclusions should be taken with caution.

Autism is a life-long disorder that affects the entire family, yet very few of the reviewed studies sought to address family dynamics. There are interrelated relationships between the behavior of the child with autism and family well-being. For example, maladaptive behavior of the child with autism influences the coping styles in fathers and mothers (Hastings et al., 2005). In addition, the functional abilities of the child with autism influence the mother's level of stress, while the mother's depression influences the level of the father's stress (Boyd, 2002). Future innovations could include both parents, siblings, grandparents, and other family members that regularly interact with the child with ASD. An intervention of this kind could serve to benefit not only the primary caregiver parent, but the entire family unit.

Although early intervention may mitigate severe symptoms for the child with autism (Rogers, 1996), there still remain unique behavioral difficulties and daily challenges for parents and families. Research on directionality has offered explanations of treatment effect based on moderating variables such as child anxiety (Silverman, Kurtines, Jaccard, & Pina, 2009) and parental distress (Osborne, McHugh, Saunders, & Reed, 2008). For example, Silverman et al. (2009) targeted improvement in youth anxiety and noted reductions in parent anxiety as the youth improved. Osborne et al. (2008) reported that effectiveness of early intervention treatment gains for children with autism was negatively impacted by elevated parental stress. Whereas, the aim of this review was to examine studies that targeted improvement in parent outcomes, future research could benefit from the examination of the intricate parent-child relationship dynamic and the reciprocal impact this may have on both parent and child variables.

The reviewed studies provide promising directions toward mental health improvements for these parents and warrants further study of the life-long effects of caregiving and best practices for intervention. Considering that parents of children with ASD are distressed and one in 68 children are diagnosed with autism, there is an alarming number of distraught parents who can benefit from, and in many cases need, treatment. This is clearly a call for more research, not only to alleviate parental psychological outcomes, but to address the enormous mental health costs that may result.

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