Routledge
Taylor & Francis Group

Evidence-Based Practice in Child and Adolescent Mental Health

ISSN: 2379-4925 (Print) 2379-4933 (Online) Journal homepage: http://www.tandfonline.com/loi/uebh20

Mindfulness-Based Stress Reduction for Parents of Children With Developmental Delays: A Follow-Up Study

Neilson Chan & Cameron L. Neece

To cite this article: Neilson Chan & Cameron L. Neece (2017): Mindfulness-Based Stress Reduction for Parents of Children With Developmental Delays: A Follow-Up Study, Evidence-Based Practice in Child and Adolescent Mental Health, DOI: 10.1080/23794925.2017.1399484

To link to this article: https://doi.org/10.1080/23794925.2017.1399484

Accepted author version posted online: 02 Nov 2017.
Published online: 05 Dec 2017.

EVIDENCE-BASED PRACTICE IN CHILD AND ADOLESCENT MENTAL HEALTH
https://doi.org/10.1080/23794925.2017.1399484

Mindfulness-Based Stress Reduction for Parents of Children With Developmental Delays: A Follow-Up Study

Neilson Chan and Cameron L. Neece

Department of Psychology, Loma Linda University, Loma Linda, CA, USA

ABSTRACT

Parents of children with developmental delays (DD) consistently report higher levels of stress compared to parents of typically developing children. Elevated parenting stress is concerning, not only because of the associated poorer physical and mental health outcomes for the parents but also because of its role in the development of behavior problems and subsequent psychopathology in their children. A growing body of research suggests that Mindfulness-Based Stress Reduction (MBSR) is effective in reducing parenting stress and child behavior problems among families of children with DD; however, there is a shortage of studies examining whether the effects of MBSR in this population are maintained in the longer term. In the current study, we used a waitlist-control design to examine whether MBSR directly improved parental mental health (i.e., parenting stress, depression, and satisfaction with life) and indirectly reduced child externalizing and internalizing behaviors. Eighty parents of children with DD between the ages of 2.5 and 5 (M = 4.18, SD = 1.01) were randomly assigned to an immediate treatment group or a waitlist-control group. Results indicated that parents who received MBSR reported significantly greater improvements in mental health outcomes as well as reduced child behaviors related to attention and withdrawn behaviors compared to parents in the control group. Further, changes seen through MBSR were maintained at a 6-month follow-up assessment. These findings suggest that improvements in parent and child outcomes through MBSR may have longer term benefits for families of children with DD.

Parenting stress is a serious concern among parents of children with developmental delays (DD). Between one third and two thirds of these parents report levels of stress in the clinically significant range (Davis & Carter, 2008; Tomanik, Harris, & Hawkins, 2004), and researchers have consistently shown that parents of children with DD report significantly higher levels of stress compared to parents of typically developing children (Baker, Blacher, Crnic, & Edelbrock, 2002; Hauser-Cram & Warfield, 2001). It is important to address the elevated levels of stress in this population, given the host of associated negative consequences. For instance, highly stressed parents are prone to compromised physical health (Eisenhower, Baker, & Blacher, 2009) and are placed at an increased risk for developing more mental health concerns, including more depressive (Hastings, Daley, Burns, & Beck, 2006; Quittner, Glueckauf, & Jackson, 1990) and anxious (Firth & Dryer, 2013) symptoms. Further, parenting stress has been found to have an adverse effect on the family environment as well as on child outcomes, including more marital conflict (Kersh, Hedvat, Hauser-Cram, & Warfield, 2006; Suárez & Baker, 1997), less effective parenting (Coldwell, Pike, & Dunn, 2006; Crnic, Gaze, & Hoffman, 2005), and increased social and behavioral difficulties in their children (Baker et al., 2003; Donenberg & Baker, 1993; Neece & Baker, 2008; Neece, Green, & Baker, 2012). Indeed, parenting stress has received substantial attention as a salient risk factor in the development of children with DD.

In particular, parenting stress has been found to be a robust predictor of the development of child behavior problems among children with DD (Baker et al., 2003; Neece et al., 2012). In fact, children with DD are at an increased risk for elevated externalizing and internalizing behavior problems compared to their typically developing peers (Baker et al., 2002; Emerson & Einfield, 2010; Merrell & Holland, 1997). This is concerning, because elevated behavior problems among

CONTACT Neilson Chan nechan@llu.edu Department of Psychology, Loma Linda University, 11130 Anderson Street, Loma Linda, CA 92354.

children with DD are commonly associated with higher rates of comorbid mental health conditions, with most studies indicating a prevalence of comorbid mental disorders 3 to 4 times higher among children with DD than among typically developing children (Baker, Neece, Fenning, Crnic, & Blacher, 2010). Despite the research showing that parenting stress is an important predictor of child outcomes, interventions targeting child psychopathology and behavior problems rarely address parenting stress directly (McIntyre, 2013). Most interventions aimed at reducing child behavior problems take a child-centered approach, either providing individual psychotherapy with the child or teaching parents to better manage child behaviors through parent training. However, given that parenting stress has consistently been associated with child behavior problems, it is a logical target for intervention. Accordingly, when we treat child behavior problems, we should also consider parents' stress levels and examine how an intervention aimed at reducing parenting stress may indirectly decrease child behavior problems.

Recently, a growing body of research has emerged examining Mindfulness-Based Stress Reduction (MBSR) as a potential stress-reduction intervention for parents of children with DD. MBSR is an empirically based, manualized intervention that has been shown to effectively reduce stress, anxiety, and depression (Grossman, Niemann, Schmidt, & Walach, 2004; Kabat-Zinn, 1990) in a variety of populations (Kabat-Zinn, 2009). Among parents of children with DD, several recent studies have been conducted using convenience sampling (Bazzano et al., 2015; Minor, Carlson, Mackenzie, Zernicke, & Jones, 2006) as well as more rigorous randomized controlled trials (Dykens, Fisher, Taylor, Lambert, & Miodrag, 2014; Neece, 2014), showing that MBSR may be both feasible (Roberts & Neece, 2015) and effective in reducing parenting stress and improving parental mental health outcomes. In addition to improved parental outcomes, parents in the Neece (2014) study who received MBSR also reported fewer behavior problems in their children, specifically those related to attention problems and ADHD symptoms, suggesting that intervening with parents' stress may also have collateral benefits to child outcomes. However, the sample size for this study was small, which may have limited the researcher's ability to detect smaller effect sizes that may be present. For instance, posttreatment group differences in child externalizing behavior problems had a medium effect size but were not statistically significant. Further, there is a limited number of studies that examine follow-up data, restricting our ability to conclude whether changes in parental mental health and child behavior problems seen through MBSR were maintained in the longer term. Although it should be noted that Dykens et al. (2014) demonstrated that the effects of MBSR on parent outcomes were maintained at a 6-month follow-up, it is important to replicate these findings in other samples as well as to examine whether indirect effects on child behavior problems are maintained in the longer term.

In the current study, we sought to replicate and extend the findings of Neece (2014) by using a larger sample size to examine whether (a) MBSR effectively improves parental mental health outcomes (i.e., parenting stress, parental depression, and satisfaction with life), (b) reductions in parenting stress through MBSR result in reductions in child behavior problems, and (c) changes in parent and child outcomes through MBSR are maintained in the longer term for families with children with DD. Families were randomly assigned to an immediate treatment or waitlist-control group. Consistent with findings from Neece, we expected that parents who were assigned to the immediate treatment group would report significantly less parenting stress and parental depression, as well as significantly greater satisfaction with life after receiving the MBSR intervention compared with parents in the waitlist-control group. In addition, we expected that children of parents who were assigned to immediate treatment group would show significantly more reductions in child behavior problems, particularly those related to attention problems. Finally, we expected that changes in parent and child outcomes through the MBSR intervention would be maintained at the 6-month follow-up.

Methods

Participants

Eligible participants included parents who had a child between 2.5 and 5 years of age who had been diagnosed with a DD, either by the Regional Center or by independent assessment. Parents

also had to report at least 10 child behavior problems on the Eyberg Child Behavior Inventory (Robinson, Eyberg, & Ross, 1980), which is the recommended cutoff score for determining risk of conduct problems. Also, the parent could not be engaged in any other form of psychological treatment at the time he or she was referred to participate in the study. Finally, children with extreme physical disabilities or intellectual impairments were excluded from the study, as this impaired their ability to participate in a parent–child interaction task that was part of the larger study. Participants were recruited in two cohorts; the first cohort began the study in 2012, and the second cohort began in 2014. In the first cohort of the study, we included only those parents who spoke and understood English; however, in the second cohort we also included monolingual Spanish-speaking parents.

Eighty parent–child dyads from two cohorts of the Mindful Awareness for Parenting Stress (MAPS) Project were included in the study. A subsample of the participants in the current study was used in the pilot study detailed in Neece (2014). The majority of the children were boys (71.25%), and the mean age of the children was 4.18 years (*SD* = 1.01 years). Our sample was ethnically diverse, with parents reporting 47.50% of the children to be Latino, 25% as Caucasian, 21.25% as Other, 3.75% as Asian, and 2.50% as African American. Among the parents sampled, the majority were mothers (96.30%) and married (75.0%), and the mean age of parents was 37.21 years (*SD* = 7.22 years). Parents completed an average of 14.43 years of education (*SD* = 2.89 years). Parents also had a diverse annual family income, ranging from $0 to more than $95,000, with 53.8% of the parents reporting an annual family income of less than $50,000. In terms of language, 17.5% of the parents were monolingual Spanish speakers. Demographic data are summarized in Table 1. Of the 80 parents, 39 were randomly assigned to an immediate treatment group, whereas 41 were randomly assigned to a waitlist control group. Table 2 shows that no differences among demographic data existed between groups at baseline. In addition, there were no significant differences in demographic data between the two cohorts.

Table 1. Demographic characteristics of participants.

	n (%)	*M* (*SD*)
Child Characteristics		
Gender		
Male	57 (71.25)	
Female	23 (28.75)	
Ethnicity		
Latino	38 (47.50)	
Caucasian	20 (25.00)	
Other	17 (21.25)	
Asian	3 (3.75)	
African American	2 (2.50)	
Age		4.18 (1.01)
Parent Characteristics		
Age		37.21 (7.22)
Grade in School		14.43 (2.88)
Mothers	77 (96.30)	
Marital Status		
Married	60 (75.00)	
Not Married	20 (25.00)	
Family Income		
< $50,000	43 (53.80)	
> $50,000	37 (46.30)	

Note. $N = 80$.

Regarding the child's diagnosis, the majority of the children (63.6%) were reported to have a diagnosis on the autism spectrum. At the time of the baseline assessment, 47.5% of the children were receiving in-home behavioral services, 88.2% of the children were reported to receive special education services in school, and 79.4% of the children were enrolled in a special education classroom. Although not formally assessed, the majority of children were estimated to have intellectual functioning in the mild-to-moderate range given the demands of the laboratory assessment. Children had to understand and follow directions in a structured play task in order to be eligible for the study.

Procedures

Procedures were approved by the Institutional Review Board at Loma Linda University. In the current study, we used data from two cohorts of the Mindful Awareness for Parenting Stress (MAPS) Project at Loma Linda University, the procedures of which were detailed in a study by Neece (2014). We recruited most of the participants through the Inland Empire Regional Center, which is a government agency that provides services for individuals with DD; additional recruitment was done through the local newspaper, local elementary

Table 2. Demographic characteristics of participants by treatment group and tests of group differences.

	Treatment[a]	Control[b]	*t*	χ^2
Children				
% Male	66.7	75.6	—	$\chi^2(1) = .78$
M Age in Years (*SD*)	4.01 (0.94)	4.34 (1.05)	$t(78) = 1.51$	—
% Caucasian	28.2	22.0	—	$\chi^2(1) = .42$
% receiving Behavioral Services	51.3	43.9	—	$\chi^2(1) = .44$
Participating Parent				
M Age in Years (*SD*)	37.72 (8.38)	36.76 (6.06)	$t(76) = -0.58$	—
% Married	82.1	68.3	—	$\chi^2(1) = 2.02$
M Grade in School (*SD*)	14.72 (3.10)	14.14 (2.67)	$t(78) = -0.89$	—
% Family Income > $50k	53.8	39.0	—	$\chi^2(1) = 1.77$

[a]$n = 39$.
[b]$n = 41$.

schools, and community disability groups. To ensure that families met the specified eligibility criteria, research staff first did a phone screening with all parents who had contacted the MAPS Laboratory and expressed interest in participating in the study. Eligible families were then scheduled for a baseline assessment and received a packet in the mail containing measures for the study's outcome variables, along with instructions to complete the packet before their baseline assessment.

At the baseline assessment, parents turned in the completed packet of questionnaires. They then signed an informed consent and were interviewed by research staff to gather demographic data. After the interview, parents were randomly assigned to an immediate treatment or waitlist-control group. Although parents were informed that their participation in the mindfulness intervention could potentially reduce their stress, and that they were assigned to participate in this intervention either immediately or at a later time, parents were blind to the waitlist-control design of the study.

The MBSR intervention followed the manual outlined by Dr. Jon Kabat-Zinn (1990) at the University of Massachusetts Medical Center. The intervention included a didactic component in which participants learn about the concept of mindfulness and stress physiology, a practice component in which group members practice mindfulness techniques, and a group discussion component. The MBSR program included eight weekly 2-hr sessions, a daylong 6-hr meditation retreat after the sixth session, and daily home practice based on audio CDs with instructions. The MBSR group leader was informed that he needed to deliver MBSR as manualized and was blind to the waitlist-control design of the study. See Neece (2014) for more details regarding the procedures for the MBSR intervention used in the study.

As part of the waitlist-control design, parents from both the immediate treatment and waitlist group returned for a second assessment, during which only the immediate treatment group had received MBSR, and parents completed the same questionnaire measures collected at the baseline assessment. After the second assessment, parents in the waitlist group received MBSR and returned to the MAPS laboratory for a posttreatment assessment. Six months following the end of the intervention for each respective group, parents from each group received a follow-up assessment. After the completion of the project (i.e., all assessments were conducted), parents received a short summary and comparison of their child's behavioral functioning over the course of the intervention in order to reinforce parents' efforts to improve their parenting skills as well as raise awareness of remaining concerns.

Treatment fidelity

Two trained research assistants assessed treatment fidelity each session using a treatment fidelity checklist developed for this project, which quantifies the number of items completed as anticipated per the manualized MBSR protocol as well as contact time reported in minutes (see Roberts & Neece, 2015, for details). Interrater reliability was high with 95.04% agreement between the two raters. In the treatment group, 73.27% ($SD = 16.60$) of the treatment content items were covered, compared to 78.03% in the control group ($SD = 9.93$), $t(34) = -1.046$, $p = .305$. Average contact time for the treatment group was

143.40 (*SD* = 74.68) and 141.75 (*SD* = 76.17) minutes for the control group, which was not significantly different, $t(34) = .065$, $p = .948$.

Measures

Demographics

Demographic variables were collected during an interview with the parent during the baseline assessment.

Parenting stress

The Parenting Stress Index–Short Form (PSI-SF) is a 36-item self-report questionnaire used to measure the extent to which a parent is experiencing stress (Abidin, 1990). Parents rate items on a 5-point Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). The PSI-SF contains subscales assessing parenting stress on three domains: Parenting-Child Dysfunctional Interaction, Difficult Child, and Parental Distress. The sum of these three subscales forms the Total Parenting Stress score. In this study, we used only the Parental Distress subscale, which captures the stress that a parent experiences in his or her role as a parent. We chose this subscale because it assesses parenting stress independent of child behavior issues, which were one of the key outcome variables of the current investigation. Some example items include "I often have the feeling that I cannot handle things well," "Since having this child, I have been unable to do new and different things," and "I feel trapped by my responsibilities as a parent." Sound psychometric properties for this scale have been strongly established (Abidin, 1990). Parents completed the PSI-SF at all assessment time points. In the current study, internal consistency for the Parental Distress subscale was good, with Cronbach's alpha ranging from .84 to .87 across the three assessment time points.

The PSI-SF also has a validity index that measures the extent to which the parents are answering in a way that they think will make them look best. A score of 10 or less on this index suggests responding in a defensive manner and indicates that caution should be used in interpreting any of the scores. Five participants had a defensive responding score of 10 or less at the follow-up assessment; accordingly, these scores were removed from the follow-up analyses.

Parental depression

The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) is a 20-item self-report questionnaire used to evaluate parental depressive symptoms. Parents rate items on a four-point Likert scale that range from 0 (*rarely or none of the time*) to 3 (*all of the time*). Example items include "I was bothered by things that usually don't bother me," "I felt depressed," and "I felt like people disliked me." A total score of 16 or higher indicates clinically significant levels of depressive symptoms. Parents completed the CES-D at all assessment time points. In the current study, internal consistency for the CES-D was good, with Cronbach's alpha ranging from .88 to .89 across the three assessment time points. In addition, previous studies indicate that the CES-D also has acceptable test–retest reliability ($r > .5$) and construct validity (Radloff, 1977).

Satisfaction with life

The Satisfaction with Life Scale (SWLS) is a five-item self-report scale used to measure global cognitive judgments of one's life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985). Parents rate items on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Example items include "In most ways my life is close to my ideal," "The conditions of my life are excellent," and "I am satisfied with life." Parents completed the SWLS at all assessment time points. This measure has been shown to have strong psychometric properties (Diener et al., 1985; Pavot & Diener, 1993; Shevlin, Brunsden, & Miles, 1998). In the current study, internal consistency for the SWLS was good, with Cronbach's alpha ranging from .79 to .87 across the three assessment time points.

Child behavior problems

The Child Behavior Checklist for Ages 1½ to 5 (CBCL; Achebach & Rescorla, 2000) was used to assess child

behavior problems. Parents rated the degree or frequency of 99 items on a scale of 0 (*not true*), 1 (*somewhat or sometimes true*), or 2 (*very true or often true*). Each item represents a behavior problem, such as "acts too young for age" and "cries a lot." The CBCL yields a total problem score, two broad-band externalizing and internalizing scores, and seven narrow-band scales, and six *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*)-oriented scales. Because child behavior problems have been conceptualized to be grouped as either internalizing or externalizing problems (Achenbach & Edelbrock, 1978), in this study we examined the four narrow-band scales that load onto the Internalizing Problems subscale (i.e., Emotionally Reactive, Depressed/Anxious, Somatic Complaints, and Withdrawn) and the two narrow-band scales that load onto the Externalizing Problems subscale (i.e., Attention Problems and Aggressive Behavior). In the current sample, the mean reliability for the total problem score was α = .93. The CBCL also shows strong convergent validity with both diagnoses based on *DSM-IV-TR* (American Psychiatric Association, 2000) diagnostic criteria and similar scales measuring child behavior problems (Achenbach & Rescorla, 2000).

Results

Preliminary data analyses

Distributions for each variable were screened for univariate outliers with *z* scores greater than 3 and multivariate outliers with Mahalanobis distances exceeding the critical value for α = .001 (Tabachnick & Fidell, 2013). One univariate outlier was found in each of the following measures: the Somatic Complaints subscale at posttreatment (z = 3.56), the Depressed/Anxious CBCL subscale at posttreatment (z = 3.21), the Withdrawn CBCL subscale at posttreatment (z = 3.13), the Aggressive Behaviors CBCL subscale at follow-up (z = 3.22), and the CES-D scale at posttreatment (z = 4.64). Following the recommendations by Cohen, Cohen, West, and Aiken (2002), all univariate outliers were set equal to plus or minus 3 *SD*s from the mean in order to reduce the influence of extreme data points on the results. No multivariate within-cell outliers were detected.

Further, demographic variables that had a significant relationship with one or more of the independent variables and one or more of the dependent variables would have been tested as covariates in the analyses. Because there were no treatment group differences in demographic variables (Table 2), no covariates were identified for the subsequent analyses involving parental mental health variables. However, for the child behavior analyses, despite the nonsignificant treatment group differences in demographic variables, we included whether the child was receiving in-home behavioral services as a covariate in order to control for potential effects of outside intervention on child behavior problems.

Regarding descriptive statistics of outcome variables, participants reported high levels of stress at baseline, with more than half of the parents (58%) experiencing "clinical" levels of stress on the PSI-SF (greater than the 90th percentile) and 14.8% reporting "high" levels of parenting stress (85th–89th percentile; Abidin, 1990). In addition, the majority of participants (55.4%) also reported "clinically significant" levels of depressive symptoms on the CES-D (scores of 16 or greater; Radloff, 1977). In terms of child behavior problems on the CBCL, children's Internalizing Problems *t* scores ranged from 37 to 83 (M = 65.73, SD = 7.27), and children's Externalizing Problems *t* scores ranged from 35 to 83 (M = 63.79, SD = 9.80). The percentage of children in the "clinical" range for Internalizing and Externalizing Problems on the CBCL are 67.9% and 46.2%, respectively (*t* scores greater than 63; Achebach & Rescorla, 2000).

Of the 80 parents who completed baseline questionnaires, 64 completed measures at the second assessment. We ran independent-sample *t* tests to compare the 64 participants at the second assessment to the 16 who dropped out on all outcome and demographic variables. There were no significant differences in outcome and demographic variables at baseline between those with and without measures at the second assessment. In addition, of the 64 parents who completed pre- and posttreatment questionnaires, 54 completed 6-month follow-up information. We ran independent-sample *t* tests to compare the 54 follow-up participants to the 10 without follow-up on all outcome and demographic variables. There were no significant differences in outcome and demographic variables at baseline between follow-up participants and those without

follow-up data, with the exception of Anxious/Depressed child behavior problems, $t(63) = 2.04$, $p < .05$; parents who did not have follow-up data reported higher levels of Anxious/Depressed child behavior problems at baseline ($M = 6.00$, $SD = 3.59$) compared to parents who returned for the follow-up assessment ($M = 4.16$, $SD = 2.43$). Accordingly, results from the Anxious/Depressed scale were interpreted with caution.

Parental mental health

We performed a 2 × 2 (Treatment Group × Time) mixed-design multivariate analysis of variance with three dependent variables (parenting stress, parental depression, and satisfaction with life) to test the hypothesis that the treatment group would show significantly greater improvements in parental mental health over time (i.e., from baseline to the second assessment) compared to the waitlist-control group. Results showed that the effect of the Treatment Group × Time interaction on parental mental health outcomes was significant, $F(3, 51) = 5.91$, Wilks's $\lambda = .74$, $p < .01$, partial $\eta^2 = .26$. Results of the multivariate analysis of variance are summarized in Table 3.

To tease apart the effects on each dependent variable for the significant Treatment Group × Time interaction, we conducted a Roy-Bargmann stepdown analysis. For the stepdown analysis, we assigned the following order of importance for each dependent variable from highest to lowest priority: parenting stress, parental depression, and satisfaction with life. Results from the stepdown analysis revealed that parenting stress was significantly predicted by the Treatment Group × Time interaction, $F(1, 61) = 11.18$, $p < .001$, partial $\eta^2 = .16$. Specifically, there was a significant decrease in parenting stress from baseline ($M = 36.41$, $SD = 8.97$) to the second assessment ($M = 30.28$, $SD = 7.20$) for the treatment group; however, for the waitlist-control group, there was no significant difference in parenting stress between baseline ($M = 39.06$, $SD = 8.12$) and the second assessment ($M = 39.65$, $SD = 7.07$). Further, parental depression was significantly predicted by the Treatment Group × Time interaction, $F(1, 53) = 18.91$, $p < .001$, partial $\eta^2 = .26$. Specifically, there was a significant decrease in parental depression from baseline ($M = 16.22$, $SD = 8.82$) to the second assessment ($M = 9.04$, $SD = 4.36$) for the treatment group; however, for the waitlist-control group, there was a slight increase in parental depression between baseline ($M = 18.72$, $SD = 9.91$) and the second assessment ($M = 20.75$, $SD = 9.89$). Finally, satisfaction with life was predicted by the Treatment Group × Time interaction with marginal significance, $F(1, 51) = 5.33$, $p < .05$, partial $\eta^2 = .10$. Specifically, there was a significant increase in satisfaction in life from baseline ($M = 22.41$, $SD = 7.17$) to the second assessment ($M = 24.90$, $SD = 4.07$) for the treatment group; however, for the waitlist-control group, there was no significant difference in satisfaction with life between baseline ($M = 20.14$, $SD = 6.02$) and the second assessment ($M = 19.37$, $SD = 6.31$). Descriptive statistics and interaction effects are summarized in Table 4. These results are consistent with our hypothesis that parents in the treatment group would show significantly less parenting stress and parental depression as well as significantly more satisfaction with life after receiving the MBSR intervention compared with parents in the waitlist-control group who did not receive MBSR.

Child behavior problems

In order to examine whether child behavior problems were different across time points depending on treatment group assignment, we conducted two 2 × 2 (Treatment Group × Time) multivariate analyses of covariance (MANCOVAs), one across the four CBCL syndrome scales that comprise the Internalizing Problems subscale (i.e., Emotionally Reactive, Anxious/Depressed, Somatic Complaints, and Withdrawn), and one across the two CBCL syndrome scales that comprise the Externalizing Problems subscale (i.e., Attention Problems and Aggressive Behavior; Achenbach & Rescorla, 2000). We included as a covariate whether the child was receiving in-home behavioral services (dummy coded) to control for the potential effects of outside behavioral intervention on child behavior problems.

For internalizing problems, the covariate (whether the child was receiving behavioral

Table 3. Results of 2 × 2 mixed-design multivariate analysis of variance and multivariate analyses of covariance.

	Multivariate *F*	Wilks's λ	*p*	Partial η^2
Parental Mental Health				
Treatment Group	5.93	.74	< .002	.26
Time	2.24	.88	> .095	.12
Treatment Group × Time	5.91	.74	< .002	.26
Child Internalizing Problems				
Behavioral Services	3.52	.82	< .012	.19
Treatment Group	1.18	.93	> .327	.07
Time	2.16	.88	> .084	.12
Behavioral Services × Time	0.43	.97	> .788	.03
Treatment Group × Time	1.37	.92	> .255	.08
Child Externalizing Problems				
Behavioral Services	6.24	.84	< .003	.16
Treatment Group	2.41	.93	> .098	.07
Time	2.38	.93	> .100	.07
Behavioral Services × Time	0.10	.99	> .905	.00
Treatment Group × Time	7.90	.80	< .001	.20

Note. Parental Mental Health included parenting stress, parental depression, and satisfaction with life. Child Internalizing Problems included emotionally reactive, anxious/depressed, somatic complaints, and withdrawn. Child Externalizing Problems included attention problems and aggressive behavior. Behavioral Services was included as a covariate. Parental Mental Health *F: df* = (3, 51), Child Internalizing Problems *F: df* = (4, 62), Child Externalizing Problems *F: df* = (2, 64).

Table 4. Dependent variable means and standard deviations and interactions of treatment group and time.

	Treatment Group										
	Treatment				Control						
	Baseline		Assessment 2		Baseline		Assessment 2				
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F* TG × T	*df*	Partial η^2
Parental Mental Health											
Parenting Stress	36.4	9.0	30.3	7.2	36.1	8.1	39.7	7.1	11.18***	1, 61	.16
Parental Depression	16.2	8.8	9.0	4.3	18.7	9.9	20.8	9.9	18.91***	1, 53	.26
Satisfaction with Life	22.4	7.2	24.9	4.1	20.1	6.0	19.4	6.3	5.33*	1, 51	.10
Child Internalizing Problems											
Emotionally Reactive	6.1	3.6	5.5	4.0	5.3	3.2	5.5	2.8	2.88†	1, 65	.04
Anxious/Depressed	4.7	2.8	4.0	3.0	4.1	2.4	3.6	2.5	0.25	1, 65	.00
Somatic Complaints	4.7	3.0	3.8	3.0	4.6	3.5	4.2	2.4	0.92	1, 65	.01
Withdrawn	6.2	2.6	4.8	2.8	6.2	2.4	6.2	2.8	4.51*	1, 65	.07
Child Externalizing Problems											
Attention Problems	5.4	2.6	4.4	2.3	5.4	2.4	5.8	3.0	10.67**	1, 65	.14
Aggressive Behavior	17.5	7.0	15.8	7.9	20.6	7.0	18.5	7.2	0.18	1, 64	.00

Note. Roy-Bargmann stepdown analyses were conducted for Parental Mental Health and Child Externalizing Problems variables. Behavioral Services was included as a covariate for Child Internalizing Problems and Child Externalizing Problems. TG = treatment group; T = time.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

services) was significant, $F(4, 62) = 3.52$, Wilks's $\lambda = .82$, $p < .01$, partial $\eta^2 = .19$. However, the Treatment Group × Time interaction effect was not significant after controlling for behavioral services, $F(4, 62) = 1.37$, $p > .05$. Results of the MANCOVA are summarized in Table 3.

Despite the overall nonsignificant MANCOVA, exploratory analyses of covariance (ANCOVAs) were conducted for the four internalizing problems syndrome scales due to previous studies showing an association between parenting stress and Withdrawn and Emotionally Reactive child behavior problems (Neece, Chan, Klein, Roberts, & Fenning, in press). The ANCOVAs revealed that the Withdrawn subscale was significantly predicted by the Treatment Group × Time interaction after controlling for behavioral services, $F(1, 65) = 4.51$, $p < .05$, partial $\eta^2 = .07$. Specifically, there was a decrease in Withdrawn behavior problems from baseline ($M = 6.19$, $SD = 2.62$) to the second assessment ($M = 4.84$, $SD = 2.81$) for the treatment group; however, for the waitlist-control group, there was no significant difference in parenting stress between baseline ($M = 6.22$, $SD = 2.42$) and the second assessment ($M = 6.28$, $SD = 2.82$). In addition, the Treatment Group × Time interaction effect was marginally significant for Emotionally Reactive subscale after controlling for behavioral

services, $F(1, 65) = 2.88$, $p = .095$, partial $\eta^2 = .04$. Specifically, there was a decrease in Emotionally Reactive behavior problems from baseline ($M = 6.13$, $SD = 3.59$) to the second assessment ($M = 5.47$, $SD = 4.02$); however, for the waitlist-control group, there was a slight increase in emotionally reactive behavior problems from baseline ($M = 5.25$, $SD = 3.23$) to the second assessment ($M = 5.47$, $SD = 2.75$). The Treatment Group × Time interaction effect was not significant for the Anxious/Depressed and Somatic Complaints scales. Descriptive statistics and interaction effects are summarized in Table 4.

For externalizing problems, the covariate (whether the child was receiving behavioral services) was significant, $F(2, 64) = 6.24$, Wilks's $\lambda = .84$, $p < .01$, partial $\eta^2 = .16$. Further, the effect of the Treatment Group × Time interaction was significant after controlling for the effect of behavioral services, $F(2, 64) = 7.90$, Wilks's $\lambda = .80$, $p < .001$, partial $\eta^2 = .20$. Results of the MANCOVA are summarized in Table 3.

To tease apart the effects on each dependent variable that comprises Externalizing Problems, we conducted a Roy-Bargmann stepdown analysis for the significant Treatment Group × Time interaction. For the stepdown analysis, we assigned the following order of importance for each dependent variable from highest to lowest, based on effect sizes from previous studies (Neece, 2014): Attention Problems followed by Aggression Problems. The stepdown analysis revealed that Attention Problems was significantly predicted by the Treatment Group × Time interaction after controlling for behavioral services, $F(1, 65) = 10.67$, $p < .01$, partial $\eta^2 = .14$. Specifically, there was a decrease in Attention Problems from baseline ($M = 5.41$, $SD = 2.60$) to the second assessment ($M = 4.41$, $SD = 2.28$) for the treatment group; however, for the waitlist-control group, there was a slight increase in Attention Problems from baseline ($M = 5.42$, $SD = 2.43$) to the second assessment ($M = 5.81$, $SD = 2.96$). The stepdown analysis also revealed that Aggressive Behavior was not significantly predicted by the Treatment Group × Time interaction ($p > .05$). Descriptive statistics and interaction effects are summarized in Table 4.

Six-month follow-up

We conducted repeated-measures ANOVAs on all measures of parental mental health, as well as repeated-measure ANCOVAs on all measures of child behavior problems that were collected at three time points (i.e., baseline, posttreatment, and at the 6-month follow-up). Whether children received in-home behavioral services was included as a covariate in analyses examining child behavior problems. The assumption of sphericity according to Mauchly's test was violated for distributions on the CES-D, $\chi^2(2) = 6.03$, $p < .05$, and Somatic Complaints scales, $\chi^2(2) = 6.47$, $p < .05$; therefore, degrees of freedom were corrected using Greenhouse-Geiser estimates of sphericity for the CES-D and Somatic Complaints analyses. Pairwise comparisons were made using a Bonferroni correction for significant results on the ANOVA and ANCOVAs. Table 5 depicts means across all time points, with significance tests. The covariate, child behavioral services, was significant for both child internalizing problems, $F(4, 51) = 3.94$, $p < .01$, partial $\eta^2 = .24$, and child externalizing problems, $F(2, 53) = 9.67$, $p < .001$, partial $\eta^2 = .27$. Means across three time points were significantly different for all measures of both parental mental health and child behavior problems after controlling for behavioral services ($ps < .05$), except for the Emotionally Reactive problems subscale, which was marginally significant ($p = .055$).

Post hoc analyses using the Bonferroni procedure revealed that all measures of parental mental health (i.e., parenting stress, parental depression, and satisfaction with life) at 6 months following treatment remained significantly lower than at baseline. For child internalizing problems, Somatic Complaints and Withdrawn scores at the 6-month follow-up were significantly lower than at baseline. For the Anxious/Depressed subscale, there was a significant decrease from baseline to posttreatment, but there was no significant difference between follow-up and baseline. All measures of child externalizing problems (i.e., Attention Problems and Aggressive Behavior) at 6 months following treatment remained significantly lower than at baseline.

Table 5. Results of repeated-measure analysis of variance/analyses of covariance and variable means at baseline, posttreatment, and 6-month follow-up.

	Baseline	Post-Tx	Follow-Up	*F*	Partial η^2
Parental Mental Health					
Parenting Stress	37.64_a	31.91_b	32.82_b	8.61***	.167
Parental Depression	17.23_a	10.48_b	11.31_b	16.56***	.278
Satisfaction with Life	20.32_a	22.89_b	24.20_b	11.50***	.211
Child Internalizing Problems					
Emotionally Reactive	5.57	4.98	4.66	$2.97^{\dagger}$	.052
Anxious/Depressed	4.20_a	3.33_b	$3.34_{a,b}$	3.26*	.057
Somatic Complaints	4.71_a	$3.88_{a,b}$	3.43_b	7.08**	.116
Withdrawn	6.45_a	5.13_b	5.14_b	8.12***	.131
Child Externalizing Problems					
Attention Problems	5.39_a	4.70_b	4.63_b	3.31*	.058
Aggressive Behavior	19.14_a	16.29_b	14.95_b	9.05***	.144

Note. Behavioral Services was included as a covariate for Child Internalizing Problems and Child Externalizing Problems. Means with different subscripts differ significantly at $p < .05$, using Bonferroni procedure. Parental Mental Health *F: df* = (2, 86). Child Internalizing Problems and Child Externalizing Problems *F: df* = (2, 108). Tx = treatment.
$^{\dagger}p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Discussion

Since the publication of our pilot study (Neece, 2014), there has been growing evidence supporting the effectiveness of MBSR in improving outcomes among families of children with developmental delays (Bazzano et al., 2015; Dykens et al., 2014). In the current study, we sought to replicate and extend the findings of our previous work, examining the efficacy of MBSR in improving parental mental health and in reducing child behavior problems for this particular population. We also examined whether changes in parent and child outcomes through MBSR were maintained at a 6-month follow-up. Consistent with findings from Neece (2014), results from the current study indicated that parents who received the intervention reported significantly greater improvements in their mental health (i.e., reduced parenting stress and depression, as well as increased general satisfaction with life) both statistically and clinically at the second assessment compared with parents who did not receive the intervention. Parents in the treatment group reported decreases of parenting stress from the 80th percentile to 67th percentile after the intervention, as well as decreases in depressive symptoms from the clinical range to below the clinical range. Further, parents in the treatment group reported increases in their satisfaction with life, changing from "average" at baseline to "high" at the second assessment. These results are consistent with those of other studies demonstrating that MBSR may be effective in improving parental outcomes (i.e., stress, depression, anxiety, self-compassion) among parents of children with DD (Bazzano et al., 2015; Dykens et al., 2014). With more than half of our sample reporting levels of stress and depressive symptoms in the clinical range at baseline, which is comparable with rates of distress reported in other studies involving parents of children with DD (Davis & Carter, 2008; Singer, 2006; Tomanik et al., 2004), it is clear that this population may benefit greatly from interventions aimed at reducing parenting stress. Results from the current study contribute to the burgeoning literature, replicating findings from other studies demonstrating the efficacy of MBSR in improving parent outcomes among parents of children with DD.

Besides improved parental mental health outcomes, results from this study also suggest that children of parents who received MBSR may also exhibit reduced behavior problems. Whereas our pilot study showed reduced behavior problems related only to attention problems (Neece, 2014), with a larger sample size in the current study, we found that parents reported not only reduced attention problems in their children but also reduced withdrawn behavior problems for children of parents who received MBSR. Although parent-report data may not be objective, they reflect the parent's perception of their child's behavior problems. Previous studies have noted the importance of parent's perception of child behavior problems, as they are related to their methods of parenting (Miller, 1995; Murphey, 1992). Indeed, it is possible that the mindfulness intervention helped the parents to become less reactive and less judgmental of internal experiences, improving their mental health via reduced stress

and depressive symptoms, which may have allowed them to be more attuned and sensitive to their children's needs (Gu, Strauss, Bond, & Cavanagh, 2015). This kind of sensitive parenting behavior may help children to be less withdrawn when interacting with others (von der Voort et al., 2014). It is important for future studies to investigate these parenting behaviors as potential mediators through which reduced stress from MBSR influences child behavior problems. Although the number of studies examining MBSR among families of children with DD has been growing, few other studies have looked specifically at the extent to which the intervention indirectly reduces child behavior problems. Thus, it is important for future studies to replicate these findings. Nonetheless, the current study provided additional evidence in support of our initial findings, such that by targeting parenting stress through MBSR, children with DD may indirectly experience a reduction in their behavior problems, particularly those related to attention and withdrawn symptoms.

Furthermore, this study demonstrated that MBSR may have longer-term benefits for families of children with DD, both directly for the parents and indirectly for their children. Specifically, improvements in all parental mental health outcomes through MBSR (i.e., parenting stress, depression, and satisfaction with life) were maintained at the 6-month follow-up assessment. Although follow-up data for MBSR interventions among this population are limited, our findings are consistent with those from other studies showing maintained improvements in parent outcomes at 2-month (Bazzano et al., 2015) and 6-month follow-up assessments (Dykens et al., 2014). In addition, our results indicated that all reductions in child behavior problems observed at posttreatment (i.e., withdrawn and attention problems) were also maintained 6 months following the completion of MBSR, providing support for our hypothesis that MBSR may have longer term collateral benefits for children of parents who receive the intervention. However, it is important to note that due to the scarcity of research examining child outcomes following MBSR among this population, there is a need for replication of these results. Even among other parent-mediated interventions aimed at reducing problematic child behaviors in this population—such as Incredible Years Parent Training for children with developmental delay (McIntyre, 2008a, 2008b) and Parent–Child Interaction Therapy (Bagner & Eyberg, 2007)—there is a shortage of follow-up data. Nevertheless, considering that the majority of parents who receive MBSR report high satisfaction and continued mindfulness practice following the completion of the intervention (Carlson, Speca, Faris, & Patel, 2007; Roberts & Neece, 2015), it is probable that the direct and indirect effects of MBSR on parental and child outcomes, respectively, may be maintained in the longer term.

The implications of these results for clinical practice are significant. Our results suggest that parenting stress may indirectly affect their children's behavior problems. This is particularly relevant for families of children with DD, who are at a greater risk for both elevated parenting stress and child behavior problems. Because interventions aimed at reducing child behavior problems in this population with the strongest empirical basis are parent-mediated (e.g., behavioral parent training programs; McIntyre, 2013), it may be important to monitor and address parenting stress when conducting these interventions in order to optimize child outcomes. It is possible that highly stressed parents may find it difficult to implement long-term parenting behavior changes that would affect their children's behavior problems, and would thus decrease the efficacy of these interventions (Guralnick, 2017; Osborne, McHugh, Saunders, & Reed, 2008). Accordingly, it may be beneficial for clinicians to augment traditional child management training programs in this population (e.g., Incredible Years Parent Training for children with developmental delay, Parent–Child Interaction Therapy; Bagner & Eyberg, 2007; McIntyre, 2008a, 2008b) by adding a mindfulness-based intervention component with the goal of reducing parenting stress and thereby optimizing the efficacy of parent-mediated interventions for child behavior problems (Crnic, Neece, McIntyre, Blacher, & Baker, 2017).

Although our findings were promising, these results must be considered within the context of several study limitations that have implications for future research. First, we did not use an active treatment control group. As a result, we can only conclude that MBSR is more effective than no treatment. To more rigorously test the efficacy of MBSR among families of children with DD, future studies should

compare MBSR to other commonly used stress-reduction interventions (see Da Paz & Wallander, 2017, and Hastings & Beck, 2004, for a review). Second, our sample was heterogeneous in terms of child diagnoses. Although the majority of children in our study were reported to have a diagnosis of autism spectrum disorder, other child diagnoses reported in our sample include Down's syndrome, intellectual disability, learning disability, Prader-Willi Syndrome, speech delay, cerebral palsy, Fragile X, and microcephaly. Considering that families of children with autism spectrum disorder tend to experience higher rates of parenting stress and behavior problems compared to those with other disabilities (Blacher & McIntyre, 2006; Dabrowska & Pisula, 2010; Kozlowski & Matson, 2012), future studies may be necessary to examine potential differences in the effects of MBSR for different diagnoses. Third, because our results relied solely on parent-report data to measure both parent and child outcomes, there may have been some reporting bias that may have influenced our findings. Future studies would benefit from utilizing biomarkers of parenting stress, as well as multimethod (e.g., rating scales, direct observation), multi-informant (e.g., parents, teachers), and multisetting (e.g., home, school) measures of child behaviors (Merrell, 2008).

Despite these limitations, the implications of these results are significant. As a highly vulnerable population, this study suggests that families of young children with DD may experience longer term benefits after receiving MBSR. With a growing body of research suggesting that parental mental health and well-being play a crucial role in a child's development (Crnic & Neece, 2015; Neece et al., 2012; Woodman, Mawdsley, & Hauser-Cram, 2015), this study provides empirical evidence for a novel approach in treating comorbid behavior problems among young children with developmental delays. By intervening with the family early on, we may be able to ameliorate some of the mental health issues common among parents of children with DD, which may then reduce the rates of behavioral problems and subsequent psychopathology among these children.

Funding

This research was supported by a Grants for Research and School Partnerships grant awarded to the second author.

References

Abidin, R. R. (1990). *Parenting stress index manual (3rd*. Charlottesville, VA: Pediatric Psychology Press.

Achenbach, T. M., & Edelbrock, C. S. (1978). The classification of child psychopathology: A review and analysis of empirical efforts. *Psychological Bulletin*, *85*(6), 1275. doi:10.1037/0033-2909.85.6.1275

Achenbach, T. M., & Rescorla, L. A. (2000). *ASEBA preschool forms & profiles*. Burlington: University of Vermont, Research Center for Children, Youth and Families.

American Psychiatric Association (2000). Diagnostic and statistical manual, 4th ed, Text Revision (DSM-IV-TR). American Psychiatric Association, Washington.American Psychiatric Association, Washington.

Bagner, D. M., & Eyberg, S. M. (2007). Parent–Child interaction therapy for disruptive behavior in children with mental retardation: A randomized controlled trial. *Journal of Clinical Child and Adolescent Psychology*, *36* (3), 418–429. doi:10.1080/15374410701448448

Baker, B., Blacher, J., Crnic, K., & Edelbrock, C. (2002). Behavior problems and parenting stress in families of three-year-old children with and without developmental delays. *American Journal of Mental Retardation*, *107*(6), 433–444. doi:10.1352/0895-8017(2002)107<0433:BPAPSI>2.0.CO;2

Baker, B. L., McIntyre, L. L., Blacher, J., Crnic, K., Edelbrock, C., & Low, C. (2003). Pre-school children with and without developmental delay: Behaviour problems and parenting stress over time. *Journal of Intellectual Disability Research*, *47*(4–5), 217–230. doi:10.1046/j.1365-2788.2003.00484.x

Baker, B. L., Neece, C. L., Fenning, R. M., Crnic, K. A., & Blacher, J. (2010). Mental disorders in five-year-old children with or without developmental delay: Focus on ADHD. *Journal of Clinical Child & Adolescent Psychology*, *39*(4), 492–505. doi:10.1080/15374416.2010.486321

Bazzano, A., Wolfe, C., Zylowska, L., Wang, S., Schuster, E., Barrett, C., & Lehrer, D. (2015). Mindfulness based stress reduction (MBSR) for parents and caregivers of individuals with developmental disabilities: A community-based approach. *Journal of Child and Family Studies*, *24*(2), 298–308. doi:10.1007/s10826-013-9836-9

Blacher, J., & McIntyre, L. L. (2006). Syndrome specificity and behavioural disorders in young adults with intellectual disability: Cultural differences in family impact. *Journal of Intellectual Disability Research*, *50*(3), 184–198. doi:10.1111/jir.2006.50.issue-3

Carlson, L. E., Speca, M., Faris, P., & Patel, K. D. (2007). One year pre–Post intervention follow-up of psychological, immune, endocrine and blood pressure outcomes of mindfulness-based stress reduction (MBSR) in breast and prostate cancer outpatients. *Brain, Behavior, and Immunity*, *21* (8), 1038–1049. doi:10.1016/j.bbi.2007.04.002

Cohen, P., Cohen, J., West, S. G., & Aiken, L. A. (2002). *Applied multiple regression/correlational analysis for behavioral sceinces*. Hillsdale, NJ: Erlbaum.

Coldwell, J., Pike, A., & Dunn, J. (2006). Household chaos–Links with parenting and child behaviour. *Journal of Child Psychology and Psychiatry*, *47*(11), 1116–1122. doi:10.1111/j.1469-7610.2006.01655.x

Crnic, K., & Neece, C. (2015). Socioemotional Consequences of Illness and Disability. *Handbook of Child Psychology and Developmental Science*, *3*(8), 1–37.

Crnic, K. A., Gaze, C., & Hoffman, C. (2005). Cumulative parenting stress across the preschool period: Relations to maternal parenting and child behaviour at age 5. *Infant and Child Development*, *14*(2), 117–132. doi:10.1002/(ISSN)1522-7219

Crnic, K. A., Neece, C. L., McIntyre, L. L., Blacher, J., & Baker, B. L. (2017). Intellectual disability and developmental risk: Promoting intervention to improve child and family well-being. *Child Development*, *88*(2), 436–445. doi:10.1111/cdev.12740

Dabrowska, A., & Pisula, E. (2010). Parenting stress and coping styles in mothers and fathers of pre-school children with autism and Down syndrome. *Journal of Intellectual Disability Research*, *54*(3), 266–280. doi:10.1111/jir.2010.54.issue-3

Da Paz, N. S., & Wallander, J. L. (2017). Interventions that target improvements in mental health for parents of children with autism spectrum disorders: A narrative review. *Clinical Psychology Review*, *51*, 1–14. doi:10.1016/j.cpr.2016.10.006

Davis, N. O., & Carter, A. S. (2008). Parenting stress in mothers and fathers of toddlers with autism spectrum disorders: Associations with child characteristics. *Journal of Autism and Developmental Disorders*, *38*(7), 1278–1291. doi:10.1007/s10803-007-0512-z

Diener, E., Emmons, R., Larsen, J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessmemt*, *49*(1), 71–75. doi:10.1207/s15327752jpa4901_13

Donenberg, G., & Baker, B. L. (1993). The impact of young children with externalizing behaviors on their families. *Journal of Abnormal Child Psychology*, *21*(2), 179–198. doi:10.1007/BF00911315

Dykens, E. M., Fisher, M. H., Taylor, J. L., Lambert, W., & Miodrag, N. (2014). Reducing distress in mothers of children with autism and other disabilities: A randomized trial. *Pediatrics*, *134*(2), e454–e463. doi:10.1542/peds.2013-3164

Eisenhower, A. S., Baker, B. L., & Blacher, J. (2009). Children's delayed development and behavior problems: Impact on mothers' perceived physical health across early childhood. *Social Science & Medicine*, *68*(1), 89–99. doi:10.1016/j.socscimed.2008.09.033

Emerson, E., & Einfeld, S. (2010). Emotional and behavioural difficulties in young children with and without developmental delay: A bi-national perspective. *Journal of Child Psychology and Psychiatry*, *51*(5), 583–593. doi:10.1111/j.1469-7610.2009.02179.x

Firth, I., & Dryer, R. (2013). The predictors of distress in parents of children with autism spectrum disorder. *Journal of Intellectual and Developmental Disability*, *38*(2), 163–171. doi:10.3109/13668250.2013.773964

Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research*, *57*(1), 35–43. doi:10.1016/S0022-3999(03)00573-7

Gu, J., Strauss, C., Bond, R., & Cavanagh, K. (2015). How do mindfulness-based cognitive therapy and mindfulness-based stress reduction improve mental health and well-being? A systematic review and meta-analysis of mediation studies. *Clinical Psychology Review*, *37*, 1–12. doi:10.1016/j.cpr.2015.01.006

Guralnick, M. J. (2017). Early intervention for children with intellectual disabilities: An update. *Journal of Applied Research in Intellectual Disabilities*, *30*(2), 211–229. doi:10.1111/jar.2017.30.issue-2

Hastings, R. P., & Beck, A. (2004). Practitioner review: Stress intervention for parents of children with intellectual disabilities. *Journal of Child Psychology and Psychiatry*, *45*(8), 1338–1349. doi:10.1111/j.1469-7610.2004.00357.x

Hastings, R. P., Daley, D., Burns, C., & Beck, A. (2006). Maternal distress and expressed emotion: Cross-sectional and longitudinal relationships with behavior problems of children with intellectual disabilities. *American Journal on Mental Retardation*, *111*(1), 48–61. doi:10.1352/0895-8017(2006)111[48:MDAEEC]2.0.CO;2

Hauser-Cram, P., & Warfield, M. (2001). Children with disabilities: A longitudinal study of child development and parent well-being. *Monographs of the Society for Research in Child Development*, i–126.

Kabat-Zinn, J. (1990). *Full catastrophe living: The program of the stress reduction clinic at the University of Massachusetts Medical Center*. New York, NY: Delta.

Kabat-Zinn, J. (2009). *Wherever you go, there you are: Mindfulness meditation in everyday life*. London, UK: Hachette UK.

Kersh, J., Hedvat, T. T., Hauser-Cram, P., & Warfield, M. E. (2006). The contribution of marital quality to the well-being of parents of children with developmental disabilities. *Journal of Intellectual Disability Research*, *50*(12), 883–893. doi:10.1111/jir.2006.50.issue-12

Kozlowski, A. M., & Matson, J. L. (2012). An examination of challenging behaviors in autistic disorder versus pervasive developmental disorder not otherwise specified: Significant differences and gender effects. *Research in Autism Spectrum Disorders*, *6*(1), 319–325. doi:10.1016/j.rasd.2011.06.005

McIntyre, L. L. (2008a). Adapting Webster-Stratton's incredible years parent training for children with developmental delay: Findings from a treatment group only study. *Journal of Intellectual Disability Research*, *52*(12), 1176–1192. doi:10.1111/jir.2008.52.issue-12

McIntyre, L. L. (2008b). Parent training for young children with developmental disabilities: Randomized controlled trial. *American Journal on Mental Retardation*, *113*(5), 356–368. doi:10.1352/2008.113:356-368

McIntyre, L. L. (2013). Parent training to reduce challenging behavior in children and adults with developmental disabilities. In R. P. Hastings & J. Rojahn (Eds.), *International review of research in developmental disabilities: Challenging behavior* (pp. 245–280). San Diego, CA: Academic Press/Elsevier.

Merrell, K. W. (2008). *Behavioral, social, and emotional assessment of children and adolescents* (3rd ed.). New York, NY: Taylor & Francis/Routledge.

Merrell, K. W., & Holland, M. L. (1997). Social-emotional behavior of preschool-age children with and without developmental delays. *Research in Developmental Disabilities*, *18*(6), 393–405. doi:10.1016/S0891-4222(97)00018-8

Miller, S. A. (1995). Parents' attributions for their children's behavior. *Child Development*, *66*(6), 1557–1584. doi:10.2307/1131897

Minor, H. G., Carlson, L. E., Mackenzie, M. J., Zernicke, K., & Jones, L. (2006). Evaluation of a mindfulness-based stress reduction (MBSR) program for caregivers of children with chronic conditions. *Social Work in Health Care*, *43*(1), 91–109. doi:10.1300/J010v43n01_06

Murphey, D. A. (1992). Constructing the child: Relations between parents' beliefs and child outcomes. *Developmental Review*, *12*(2), 199–232. doi:10.1016/0273-2297(92)90009-Q

Neece, C. L. (2014). Mindfulness-based stress reduction for parents of young children with developmental delays: Implications for parental mental health and child behavior problems. *Journal of Applied Research in Intellectual Disabilities*, *27*(2), 174–186. doi:10.1111/jar.2014.27.issue-2

Neece, C., & Baker, B. (2008). Predicting maternal parenting stress in middle childhood: The roles of child intellectual status, behaviour problems and social skills. *Journal of Intellectual Disability Research*, *52*(12), 1114–1128. doi:10.1111/jir.2008.52.issue-12

Neece, C. L., Chan, N., Klein, K., Roberts, L., & Fenning, R. (in press). *Mindfulness-based stress reduction for parents of children with developmental delays: Understanding the experience of Latino families*.

Neece, C. L., Green, S. A., & Baker, B. L. (2012). Parenting stress and child behavior problems: A transactional relationship across time. *American Journal on Intellectual and Developmental Disabilities*, *117*(1), 48–66. doi:10.1352/1944-7558-117.1.48

Osborne, L. A., McHugh, L., Saunders, J., & Reed, P. (2008). Parenting stress reduces the effectiveness of early teaching interventions for autistic spectrum disorders. *Journal of Autism and Developmental Disorders*, *38*(6), 1092. doi:10.1007/s10803-007-0497-7

Pavot, W., & Diener, E. (1993). Review of the satisfaction with life scale. *Psychological Assessment*, *5*, 164. doi:10.1037/1040-3590.5.2.164

Quittner, A. L., Glueckauf, R. L., & Jackson, D. N. (1990). Chronic parenting stress: Moderating versus mediating effects of social support. *Journal of Personality and Social Psychology*, *59*(6), 1266. doi:10.1037/0022-3514.59.6.1266

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*, 385–401. doi:10.1177/014662167700100306

Roberts, L. R., & Neece, C. L. (2015). Feasibility of mindfulness-based stress reduction intervention for parents of children with developmental delays. *Issues in Mental Health Nursing*, *36*(8), 592–602. doi:10.3109/01612840.2015.1017063

Robinson, E. A., Eyberg, S. M., & Ross, A. W. (1980). The standardization of an inventory of child conduct problem behaviors. *Journal of Clinical Child & Adolescent Psychology*, *9*(1), 22–28. doi:10.1080/15374418009532938

Shevlin, M., Brunsden, V., & Miles, J. N. V. (1998). Satisfaction with life scale: Analysis of factorial invariance, mean structures and reliability. *Personality and Individual Differences*, *25*, 911–916. doi:10.1016/S0191-8869(98)00088-9

Singer, G. H. (2006). Meta-analysis of comparative studies of depression in mothers of children with and without developmental disabilities. *American Journal on Mental Retardation*, *111*(3), 155–169. doi:10.1352/0895-8017(2006)111[155:MOCSOD]2.0.CO;2

Suarez, L. M., & Baker, B. L. (1997). Child externalizing behavior and parents' stress: The role of social support. *Family Relations*, 373–381. doi:10.2307/585097

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston, MA: Allyn & Bacon.

Tomanik, S., Harris, G. E., & Hawkins, J. (2004). The relationship between behaviours exhibited by children with autism and maternal stress. *Journal of Intellectual and Developmental Disability*, *29*(1), 16–26. doi:10.1080/13668250410001662892

van der Voort, A., Linting, M., Juffer, F., Bakermans-Kranenburg, M. J., Schoenmaker, C., & van IJzendoorn, M. H. (2014). The development of adolescents' internalizing behavior: Longitudinal effects of maternal sensitivity and child inhibition. *Journal of Youth and Adolescence*, *43*(4), 528–540. doi:10.1007/s10964-013-9976-7

Woodman, A. C., Mawdsley, H. P., & Hauser-Cram, P. (2015). Parenting stress and child behavior problems within families of children with developmental disabilities: Transactional relations across 15 years. *Research in Developmental Disabilities*, *36*, 246–276. doi:10.1016/j.ridd.2014.10.011