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Feasibility of Mindfulness-based Stress Reduction Intervention for Parents of Children with Developmental Delays

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Mindfulness-based stress reduction (MBSR) interventions are popular as a treatment strategy for myriad diagnoses in various settings, and may be beneficial for parents of children with developmental delays (DD). However, prior research suggests extreme levels of stress and extraordinary demands on time among these parents, making the feasibility of effectively implementing MBSR with this population questionable. This study examined the feasibility of administering standard MBSR to a diverse community-based sample of parents of young children with DD. The potential impact of MBSR interventions includes improvement in parents' mental health, and collateral benefits for the family environment, including improved child behavior. Nurses may have an integral role in interdisciplinary teams providing MBSR.

INTRODUCTION

A growing body of research suggests that Mindfulness-based Stress Reduction (MBSR) is an effective intervention that helps participants tolerate negative emotional states and enhance adaptive coping techniques. The practice of 'mindfulness' requires the development of an intentional state of moment-to-moment awareness of internal and external stimuli in a non-judgmental fashion (Baer, 2003; Davis & Hayes, 2011), allowing observations to be dealt with as needed, putting the mindfulness practitioner in the position of choosing how to respond rather than being in a constant state of reactivity. MBSR is a specific manualized mindfulness intervention program supported by over two decades of extensive research showing its effectiveness in reducing stress, anxiety, and depression, and promoting overall wellbeing (Chiesa & Serretti, 2009). Previous studies indicate that MBSR effectively increases participants' ability to cope more effectively with both short- and long-term stressful situations, critical skills for parents of children with DD.

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Mindfulness interventions have been used with parents for the prevention and treatment of mental health problems; however, until recently, MBSR specifically has not been used to address parental stress (Bazzano et al., 2013; Neece, 2013). Findings indicate that general mindfulness practices are effective in reducing parental stress, rumination, and reactivity, while decreasing dysfunctional parenting habits as well as improving the broader family environment, including marital function and co-parenting (Bögels, Lehtonen, & Restifo, 2010). These types of interventions may be particularly beneficial for parents of children with developmental delays (DD), where levels of parenting stress are especially high (Baker et al., 2003; Emerson, 2003; Ferraioli & Harris, 2013; Hauser-Cram, Warfield, Shonkoff, & Krauss, 2001; Neece, Green, & Baker, 2012).

In addition to elevated levels of stress, parents of children with DD also show increased rates of depression (Baker, Blacher, & Olsson, 2005; Eisenhower, Baker, & Blacher, 2005; Hastings, Daley, Burns, & Beck, 2006; Olsson & Hwang, 2001; Singer, 2006) and often report high levels of marital conflict (Kersh, Hedvat, Hauser-Cram, & Warfield, 2006; Suárez & Baker, 1997), as well as less effective parenting (Coldwell, Pike, & Dunn, 2006; Crnic, Gaze, & Hoffman, 2005). Adult-oriented services for parents of children with DD are needed to improve mental health (Dykens, Fisher, Taylor, Lambert, & Miodrag, 2014). Along with challenges to mental health, parents of children with DD also experience challenges to their physical health (Eisenhower, Baker, & Blacher, 2009; Eisenhower, Blacher, & Baker, 2013; Oelofsen & Richardson, 2006; Olsson & Hwang, 2008), and higher levels of self-reported health problems appear to persist across the lifespan (Burton, Lethbridge, & Phipps, 2008; Eisenhower et al., 2013).

The standard MBSR program includes eight weekly 2.5-h group sessions, a day-long meditation retreat during the 6th week of the program, and daily home practice based on audio CDs, including a minimum of 45 min/day of formal mindfulness practice and 5–15 min of informal practice (Kabat-Zinn, 2013; Santorelli, 2014). Formal mindfulness exercises aim to increase the capacity for mindfulness (i.e., present-moment awareness

with a compassionate, non-judgmental stance), and include a body scan, mindful yoga, and sitting meditation. Participants receive audio recordings containing 45-min guided mindfulness exercises (i.e., body scan, yoga, and sitting meditation) that they are instructed to practice daily at home. To facilitate the integration of mindfulness into daily life, parents are also taught to practice mindfulness informally in everyday activities. During classes, the formal mindfulness exercises are practiced, and didactic instruction is provided on stress physiology and using mindfulness for coping with stress in daily life.

While the efficacy of MBSR is generally well established (Praissman, 2008), parents suffering significant levels of parenting distress are a vulnerable population at risk for poorer mental health (Johnson, Frenn, Feetham, & Simpson, 2011), which may decrease the feasibility of delivering MBSR due to the demanding nature of a full MBSR intervention. Many mindfulness interventions have been adapted from MBSR to facilitate intervention delivery to populations with challenging circumstances, including families of children with DD and caregivers of children with chronic conditions (Dykens, 2012; Minor, Carlson, Mackenzie, Zarnicke, & Jones, 2006). Such adaptations generally include shorter sessions, fewer sessions, and the removal of the day-long retreat, indicating that up until this point, the feasibility of MBSR for parents of children with delays has been questionable. Additional challenges may be inherent in delivering MBSR to diverse, community-based samples. Furthermore, previous research suggests that abbreviating standard MBSR may significantly decrease the efficacy of the intervention (Josefsson, Lindwall, & Broberg, 2012), further underscoring the need to identify whether the intensive standard MBSR intervention is feasible with this high-risk population of parents.

Feasibility generally includes assessment of resources available, consideration of target population needs and fit of an intervention, recruitment potential, organizational support, community acceptance of the intended intervention, program evaluation, and sustainability (Altschuler, Rosenbaum, Gordon, Canales, & Avins, 2012; Goddard & Harding, 2003). The purpose of this paper was to demonstrate the feasibility of using standardized MBSR intervention for parents of children with DD, expanding on initial research regarding the efficacy of MBSR among these parents (Neece, 2013). Using the same sample and dataset (see below for details), we examined the feasibility of delivering an effective, reliable standard MBSR intervention to ameliorate parental stress in a sample of parents of children with DD. We operationalized feasibility as organizational support (indicated by commitment of resources); successful recruitment and completion rate (measured by enrollment, attendance and attrition); target population need and fit of intervention (factors contributing to or hindering participation) acceptance of the intervention (measured by self-reported participant satisfaction and program evaluation), and sustainability (measured as continued mindfulness practice).

METHODS

Participants

The current study involved 43 parents, which included parents of children ages 2.5–5 years old, with DD. In California, nearly all families of individuals with DD receive services from one of nine Regional Centers. Families who met the inclusion criteria were selected by the Regional Center's computer databases and received a letter and brochure informing them of the study. Information about the study was also posted on a website, which allowed interested parents to submit their information (Neece, 2013).

Criteria for inclusion in the study were: (a) Having a child aged 2.5–5 years; (b) the child was determined by the Regional Center (or by an independent assessment) to have a developmental delay; (c) parent(s) who reported more than 10 child behavior problems (the recommended cut-off score for determining risk of conduct problems) on the Eyberg Child Behavior Inventory (Robinson, Eyberg, & Ross, 1980); (d) the parent was not receiving any form of psychological or behavioral treatment at the time of referral (e.g., counseling, parent training, parent support group, etc.); (e) the parent agreed to participate in the intervention (determined by parent signing the consent form); (f) the parent spoke and understood English. Exclusion criteria included parents of children with debilitating physical disabilities (e.g., child is not ambulatory) or severe intellectual impairments that prevented the child from participating in a parent–child interaction task that was a part of the larger laboratory assessment protocol. In order to be included, parents must also have completed all initial measures and attended the initial assessment before the beginning of the first intervention session (Neece, 2013).

Regarding the child's diagnosis, the majority of the children (84.8%) were reported to have a diagnosis on the autism spectrum. Most parents (76.8%) reported that their child's diagnosis was autistic disorder, and the remaining children were reported to have another diagnosis on the autism spectrum. According to the Gilliam Autism Rating Scale (Gilliam, 1995), 83.3% of the children reported to have an ASD had a 'very likely' diagnosis of autism and the remaining 16.7% had a 'possible' diagnosis. At the time of the intake assessment, 91.3% of the children were reported to receive special education services in school and 78.3% 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 needed to understand and follow directions in a structured play task in order to be eligible for the study (Neece, 2013).

Table 1 depicts the demographic characteristics of the parents who participated in the current study. In the combined sample, participants were primarily of a minority status (62.8%), of which 39.5% were Hispanic. On average, most had

completed at least some college. Annual family income ranged from $0 to over $95,000, with less than half (45.8%) of all participants reporting a family income of more than $50,000 per year, and 27.3% reporting an income below the poverty line for San Bernardino County, which is the second-poorest region in the country (US Census Bureau, 2010). Also, despite being the fourth most populous county in the state, San Bernardino County has been identified as the most sprawling region in the USA, with a lack of transportation choices, town centers, mixed use neighborhoods, and poorly connected street networks (Bluffstone, Braman, Fernandez, Scott, & Lee, 2008; Gold & Ritsch, 2002). Therefore, participants traveled an average of 31.18 miles to attend each MBSR session, with an estimated time of 44 min in optimal conditions. The average number of years of education completed by parents was 14.54 years, with a standard deviation (SD) of 2.67. The parents' mean age was 35.06 years, with an SD of 8.57. Most of the participating parents were married (71.7%) and were mothers (78.3%), with the remaining sample made up of fathers. Parents also started the study with high levels of stress. Over half of the parents (56%) reported experiencing 'clinical' levels of stress on the Parenting Stress Index (>90th percentile) and 17.1% reported 'high' levels (85–89th percentile). Only 26.9% of the sample reported levels that were not in the clinical or high range (Abidin, 1990). There were no significant differences in the participating parents' age, mother's race, father's race, marital status, education, income, or initial levels of stress between the immediate treatment group compared with those in the waitlist–control group. There were also no statistically significant ($p<0.05$) demographic differences between participants who completed the intervention and those who dropped out of the study.

Procedures

Interested parents contacted the study personnel by phone, postcard, or submitting their information on the project website. Study personnel then conducted a phone screen to determine the eligibility of the parent(s). If the parent(s) met the inclusion criteria, an intake laboratory assessment was scheduled. After completing the informed consent and an interview to collect demographic information, the participants were randomly assigned to the immediate treatment or waitlist–control intervention group (Neece, 2013). For the purposes of this paper, the groups were combined for analysis of treatment feasibility across the intervention. Between-group analyses were conducted examining treatment fidelity to assess for equivalence of treatment delivery in the two groups.

Parents assigned to the immediate treatment group began the intervention in March 2012 and parents assigned to the control group began the intervention in June 2012. The 8-week MBSR intervention followed the manual outlined by Dr Jon Kabat-Zinn at the University of Massachusetts Medical Center (Kabat-Zinn, 2013). This intervention consisted of three main components:

1. Didactic material covering the concept of mindfulness, the psychology and physiology of stress and anxiety, and ways in which mindfulness can be implemented in everyday life to facilitate more adaptive responses to challenges and distress;
2. Mindfulness exercises during the group meetings and as homework between sessions;
3. Discussion and sharing in pairs and in the larger group.

As reviewed in the Introduction, the MBSR program included eight weekly 2-h sessions, a day-long 6-h meditation retreat after class six, and daily home practice based on audio CDs with instruction. Formal mindfulness exercises included the body scan, sitting meditation with awareness of breath, and mindful movement. The instructor for the group had over 20 years' experience practicing mindfulness and teaching MBSR, completed the Advanced MBSR Teacher Training at the University of Massachusetts Medical Center, and had received supervision with Senior MBSR teachers through the Center for Mindfulness at the University of Massachusetts Medical Center (Neece, 2013). While parents participated in the MBSR intervention, trained doctoral students specializing in child clinical psychology from the university provided childcare, under the supervision of a licensed psychologist. No intervention was delivered to the children.

Participants were paid $75 for completion of questionnaires and laboratory assessments, to compensate them for their time. Other benefits to participants included paid parking during lab assessments; childcare provided during weekly intervention group meetings; access to specialists in child development; the opportunity to learn more about their children's abilities across various situations; a feedback report on their child's behavioral development after the end of the intervention; and e-mailed links to community mindfulness opportunities and resources to reinforce ongoing practice after program completion. Institutional review board approval was obtained for the protection of human subjects prior to commencing this intervention study.

Treatment Fidelity

Treatment fidelity was assessed at each MBSR session using a treatment fidelity checklist developed by an advanced practice nurse (APN) for this project. This MBSR treatment fidelity measure is specific to each session of the MBSR intervention. The Mindfulness-based Stress Reduction Curriculum Guide (Blacker, Meleo-Meyer, Kabat-Zinn, & Santorelli, 2009) was operationalized as weekly checklists for each session and included the program components to be delivered, dichotomous rating of adherence for each component, treatment dose measured as minutes of contact the instructor had with the group, and allowance for qualitative notes regarding context (any disruptions, environmental factors, participant reactions, etc.) and nonspecific treatment effects, such as quality of instructor–participant relationships.

Two independent reviewers (an APN and a doctoral psychology student), completed a checklist during each session by direct

TABLE 1
Demographic Characteristics of Participants by Treatment Group

Participating parent	Immediate ($n = 18$)	Waitlist–Control ($n = 25$)	χ^2 or t
PSI score in clinical range (%)	47.6	68.4	$\chi^2 = 1.02$
Age (years) (mean ± SD)	33.24 ± 8.55	36.44 ± 8.41	$t = 1.21$
Mother's race (%)			$\chi^2 = 5.20$
African-American	6	0	
Asian	11	8	
Caucasian	44	32	
Hispanic	33	44	
Other	6	16	
Father's race (%)			$\chi^2 = 4.43$
African-American	6	4	
Asian	0	8	
Caucasian	44	28	
Hispanic	39	44	
Other	11	16	
Marital status (% married)	83	64.0	$\chi^2 = 2.18$
Grade in school (mean ± SD)	14.84 ± 1.98	14.28 ± 3.90	$t = 0.69$
Family income (% >$50K)	55.6	36.0	$\chi^2 = 2.51$

$^{*}p < 0.05, ^{**}p < 0.01, ^{***}p < 0.001$. Parenting stress index (PSI) scores in the 90th percentile or higher indicate clinically significant stress (Abidin, 1990).

observation, for the purpose of identifying any discrepancy between the standardized protocol and the intervention delivery. Both independent reviewers were trained to utilize the treatment fidelity checklist prior to data collection. Training included reading the MBSR manual and discussion about the characteristics of each item on the checklist. On every checklist, each treatment component was given a 'yes' or 'no' rating for adherence and the total length of contact was documented. At the end of each group session, independent reviewers compared and discussed checklists; inter-rater agreement was 98.8% (calculated by dividing the number of items agreed upon by the total number of items). Additionally, qualitative notes containing observations regarding unanticipated interruptions or delays, general tenor of group participation, and theme of discussions were documented.

The treatment fidelity checklist quantitative scores were calculated according to the number of items completed as anticipated per the manualized MBSR protocol and contact time reported in minutes. The immediate treatment group had a mean of 17.00 (SD 2.20) completed items out of a possible treatment delivery of 20, compared with the waitlist–control group that had a mean of 16.23 (SD 2.16). The difference in treatment delivery scores was not significant (t [16] = 0.753, $p = 0.463$); 95% CI [–1.41, 2.95]; $d = 0.35$. Average contact time for the immediate treatment group was 141.11 (SD 76.76) and 140.00 (SD 77.14) for the waitlist–control group, which also was not significantly different (t [16] = 0.031, $p = 0.976$); 95% CI [–75.79, 78.01]; $d = 0.01$.

Measures

Participant Attendance

Attendance data was collected at every intervention session and attendance was calculated for each participant as the total number of sessions attended.

Application of Mindfulness

Participants were asked to report: 'On a scale of 0 to 10, how much did you use your mindfulness skills this week? 0 indicates no use at all; 10 indicates very frequent, almost constant use.' This item was collected at the beginning of each group, resulting in a total of nine ratings for each participant (eight weekly groups and a day-long retreat). It was intended to measure formal rather than informal mindfulness practice, though this distinction was not made to participants. This item was adapted from the Subjective Units of Mindfulness used by Singh and colleagues (2007), which was a subjective measure of maternal use of mindfulness in parenting.

Five Facets of Mindfulness Questionnaire (FFMQ)

The FFMQ (Baer et al., 2008) is a 39-item instrument that was used to assess the parents' use of different elements of mindfulness. The measure includes five independent sub-scales: observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. Each item was rated on a 5-point Likert-type scale, ranging from 1 (*never or very rarely true*) to 5 (*very often or always true*). Alpha coefficients for the sub-scales were 0.74–0.90 with the exception

of the observing sub-scale, which had alpha coefficients ranging from 0.70 to 0.85. We administered the FFMQ measure at the first, fifth, and last session and looked at changes in the mindfulness components over the course of the intervention.

Participant Satisfaction and Program Evaluation

At the last MBSR session, an 11-item final evaluation form created for this study, containing open-ended questions was given to all participants. These items were designed to elicit the overall program and process feedback, and allow participants to express issues or comments that may not have been otherwise addressed. Additionally, a post-hoc assessment of incentives and obstacles was conducted to evaluate how the $75 honorarium for participating in the research study contributed to parents' decision to participate, as well as identify obstacles that may have hindered participation.

The lead author and an independent reviewer analyzed all responses using standard qualitative data analysis procedures: briefly, all responses were coded and organized into categories with sub-codes. This allowed systematic content analysis (Berg, 2009) for summary and interpretation (Corbin & Strauss, 2008). Two coders independently reviewed participant responses to determine reliability of coding. Inter-coder reliability was determined by dividing the number of agreed upon codes by all codes, the result of which was multiplied by 100 (Kelsey, 1996). The overall agreement was 97.4%. The patterns that emerged were: positive changes in stress levels; improved ability to handle stress; calmer interactions; and high program satisfaction. Responses from individual participants often contributed to more than one theme, therefore, the results are reported as a percentage of endorsements for each theme, rather than the percentage of participants.

Assessment of Continued Mindfulness Practice

The post-treatment assessment, typically 2 weeks after the intervention ended (up to a maximum of 6 weeks following the intervention), included two items regarding continued formal mindfulness practice. The first question was: 'Since the group ended, how much have you been practicing mindfulness?' with Likert-type scale ranging from 1 (*hardly ever or not at all*) to 6 (*nearly every day*). The second question was: 'Have you attended any other mindfulness group or retreat since the group ended?' with a 'yes/no' response option.

RESULTS

Organizational Support and Resources

In order to make this project feasible, the university supplied start-up funds and a small seed grant to finance the project, lab space for data collection and storage, and use of two rooms in a mental health treatment center to accommodate childcare and the MBSR parent sessions. It was important to have the rooms on opposite ends of the center to allow parents to participate without distraction. The budget included clinical costs, such as salary for the MBSR instructor, MBSR supplies (e.g., yoga mats, blankets, workbooks); food for childcare group; recruitment materials (e.g., brochures) and office supplies as well as research costs (e.g., participant payments; cost of standardized assessments, computers and computer programs, video equipment). The clinical costs of the project accounted for 67% of the total budget ($10,750). With permission, toy donations and volunteer graduate students were solicited to provide childcare services.

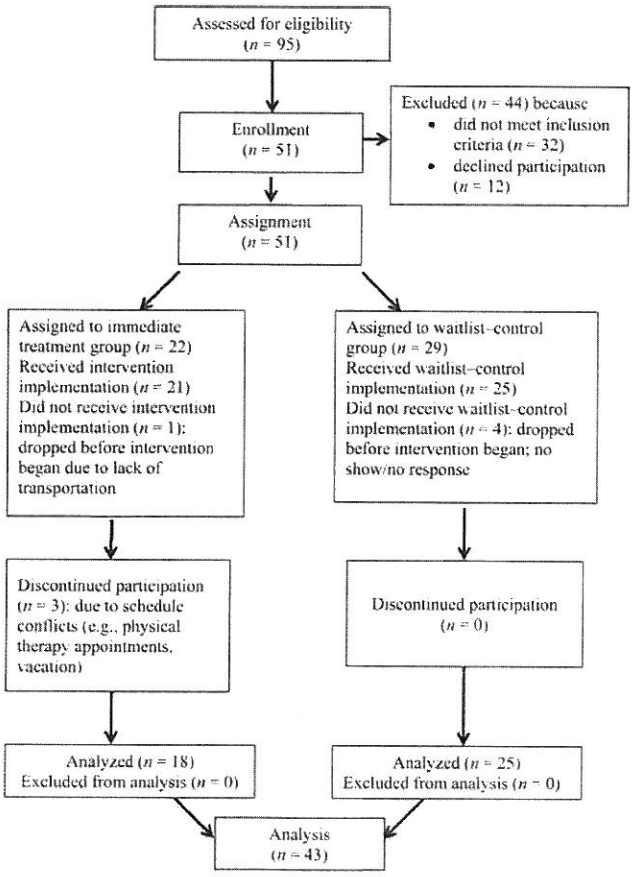

FIGURE 1. Flow of participants through each stage of study.

Participant Recruitment and Attendance

In total, 95 families were screened for the study; 63 were determined to be eligible, and 51 parents enrolled in the study originally. Of those original 51, five dropped out before beginning the program; another three discontinued later in the program leaving 18 parents in the immediate treatment group and 25 in the waitlist–control group, for a total of 43 participating parents (Figure 1), yielding an 84.3% completion rate and an attrition rate of 15.7%.

Only four participants attended all sessions, including the retreat. Overall attendance rates were higher for the immediate treatment group, with 74% of participants attending seven or more sessions; compared with the waitlist–control group,

where only 47% of participants attended seven or more sessions (see Table 2). Post-hoc analysis of participants' reasons for missed sessions revealed participant or child illness (67%) and scheduling conflicts (25%) as the primary reasons for absences. Obstacles that hindered program participation included, primarily, the distance to program (31%) and time for sessions (31%). Other obstacles mentioned were paperwork, pre-planned vacation, language barriers, social phobia, change in routine, and limited family support. Of these obstacles, pre-planned vacations only affected attendance among participants in the waitlist–control group.

On post-hoc analysis, 56% of the respondents reported that knowing they were going to be paid $75 for participating in the research assessments did not contribute to their decision to participate, as exemplified in this quote:

> I didn't do the classes for the incentive, I thought the classes were really helpful.

The remaining 44% who reported that the $75 *did* contribute to their decision to participate, indicated that it was 'gas money' so that they *could* participate (86%).

Besides the $75 payment, other factors reported by respondents as having most impacted their decision to participate in the program are as follows: mindfulness training (94%); desire to be a better parent (81%); childcare (43%); networking/fellowship (25%); and trust in the institution offering the program (13%). The factors reported as least impacting respondents' decisions to participate were declared as: 'none' (44%); research incentive (38%); understanding child's condition (12%); distance (6%); and free of cost (6%).

Application of Mindfulness Techniques during Intervention

Hierarchical linear modeling was used to examine changes in parents' use of mindfulness techniques across the course of the intervention. To examine significant change over time, unconditional growth models, which test where there was a significant change over time, were conducted including only an intercept (representing the dependent variable at Time 1) and slope (representing the linear rate of change of the dependent variable across the intervention). Other growth functions were also examined to determine whether changes in mindfulness over the course of the intervention were linear or resembled another growth trajectory (i.e., quadratic and cubic functions). An additional growth function would have been included in the model if it significantly improved the model fit and reduced the deviance statistic as indicated by the χ^2 model comparison test; however, no other growth functions met this criteria. As discussed in the Methods section, the application of mindfulness item was administered to participants at each group session and the day-long retreat, providing a total of nine data points that were used to model the trajectory of mindfulness use across the MBSR group. The variable used to represent time ranged at 0–8.

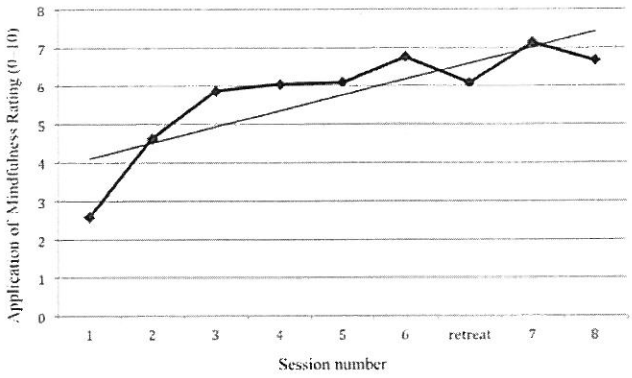

FIGURE 2. Mean Application of Mindfulness Score across MBSR sessions. Combined treatment and waitlist–control group ($n = 48$). Straight line represents overall trend line for slope trajectory.

Results indicated that parents' use of mindfulness significantly increased over the course of the group ($B = 0.46$, $p < 0.001$). On average, parents started out at a 3.69 out of 10 (0 indicating no use at all; 10 indicating very frequent, almost constant use) in their use of mindfulness and this increased an average of about a half a point each session. The mean rating for each session is depicted in Figure 2. Of note, there was significant variability in the amount of mindfulness parents practiced at the start of the group (intercept variance component = 4.08, $p < 0.001$), as well as their trajectories (slope variance component = 0.06, $p < 0.001$). Additionally, data collected at the post-treatment assessment revealed that after completion of the intervention, most parents (73.9%) reported continued practice of mindfulness a few days a week to nearly every day. None of the parents reported having attended any other mindfulness group or retreat after the study group ended.

Evaluation of Mindfulness Attributes

Participants self-reported their level of mindful attributes (defined as the five facets of the FFMQ) at the first, fifth, and last sessions. The development of mindful attributes suggests utilization of mindfulness intervention skills in daily life settings in which mindfulness might be applied. Analysis of changes in self-reported mindfulness attributes over the course of the intervention was also analyzed using hierarchical linear modeling. An unconditional growth model was conducted including only an intercept (representing the dependent variable at Time 1) and slope (representing the linear rate of change of the dependent variable across the intervention). Similar to the analyses described above, other growth functions (i.e., quadratic and cubic functions) were also examined to determine whether they improved the fit of the model; however, no other growth functions improved the fit of the model. Results of the growth models examining changes in the five facets of mindfulness are presented in Table 3. All five facets of mindfulness significantly increased over the course of the intervention. As participants gained knowledge and experience with the five facets of

TABLE 2
Attendance

	Immediate ($n = 18$)		Waitlist–Control ($n = 25$)		Combined ($n = 43$)
Session	n	(%)	n	(%)	(%)
1	17	94	22	88	91
2	17	94	18	72	83
3	14	78	16	64	71
4	9	50	14	56	53
5	14	78	10	40	59
6	13	72	11	44	58
Day-long retreat	13	72	12	48	60
7	13	72	13	52	62
8	14	78	10	40	59

mindfulness, their self-reports of these attributes increased as they progressed through the intervention. Follow-up paired sample t-tests were conducted to determine how these facets changed from the beginning (session 1), to the middle (session 5), and at the end (session 8) of the MBSR group. Table 4 includes the means scores for each mindfulness domain across the intervention. 'Non-reactivity to inner experience', 'observing', and 'non-judging of inner experiences' had each significantly increased by week 5, and by week 8, all facets of mindfulness had significantly increased demonstrating medium to very large effect sizes (Cohen, 1988).

Participant Satisfaction

At the end of the program, 30 participants (70%) completed a participant satisfaction questionnaire. Of the participants absent at the final session, only four subsequently returned the questionnaire. In response to an item asking what, if any, changes were noticed in stress levels, there were 34 (80%) positive self-reported changes noticed in stress levels, including overall decrease in stress level, less stress in particular areas, and that while stress levels were variable, the duration of high levels of stress was shorter and still under control.

> I am still stressed from some things but not other things . . . Nowhere near as much stress as before.

One (2%) negative response to this item indicated an increase in stress (due to a particular circumstance in the participant's life) but qualified that there was 'good stress and bad stress.' Seven (16%) neutral responses acknowledged relatively unchanged stress levels but expressed that their stress felt more manageable, noting 'it has become 2nd nature to do them [mindfulness skills] especially in those moments.'

Next, participants were asked what changes, if any, they had noticed in their response to stress. A total of 44 (94%) positive responses encompassed less emotional reactivity; decreased physical stress response (tension, shortness of breath, sleep disturbance); ability to evaluate stressful situations; early awareness allowing calm intervention; intentional pause before response; and reflection. One participant's response simply stated:

> [I am] able to separate myself from the stress and then make more rational choices.

The one (2%) negative response to this item was that the participant had a hard time achieving the result he/she wanted, however, it is noteworthy that this participant self-reported that he/she had not been able to attend most of the sessions and had no time to practice. There were two (4%) neutral responses, noting not much change in response to stress, yet able to 'cope with stress pretty successfully'.

Responses to a question regarding 'what about the group had been most beneficial', were completely positive ($n = 44$), with no negative or neutral responses. Participants indicated that the benefits resulting from group participation included: making time for themselves; sharing experiences; insight gained; and learning to be in the moment through skills learned, such as noting one's thoughts and body sensations, breathing techniques, meditation, and yoga.

The next item asked participants to indicate what part of the course had been least beneficial to them. In total, 16 (55%) were neutral responses, such as 'I'm not sure', or left blank. Five (17%) negative responses indicated a particular activity, such as body scan, standing yoga, visualization exercises, and answering survey questions; and one indicated the distance the participant had to drive. Eight (28%) respondents took the opportunity to give a positive response, such as 'not any, everything was good'.

Program satisfaction was very high, as indicated by responses to overall opinion of the course, whether or not they would recommend the course to others, or repeat it themselves. Overall opinion of the course received 40 (96%) positive responses endorsing the course as useful, enjoyable, and transformative.

> Very positive experience. Definitely found it to have an impact on my daily life.

TABLE 3
Results of Unconditional Growth Models

Variable	Intercept parameter (g_{00})	Slope parameter (g_{10})	Intercept variance component (d_0)	Slope variance component (d_1)
Observe	23.84 (0.78)***	2.63 (0.64)***	16.12***	7.00***
Describe	26.14 (1.00)***	1.09 (0.44)*	35.64***	1.44*
Act with awareness	22.11 (0.11)***	2.19 (0.62)***	17.82***	5.82**
Non-judgmental	22.60 (1.04)***	1.02 (0.56)***	35.68***	3.11*
Non-reactive	18.58 (0.61)***	2.86 (0.41)***	11.09***	2.61*

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. Intercept and slope parameters are presented with standard error in parentheses.

There were no negative responses to this item and two (4%) neutral responses, indicating that time to practice and ability to attend sessions was essential to get the most out of the course.

One item asked if participants would recommend this course to a friend and the next item asked if they would sign up again if given the chance, given what they now knew about the course; all 30 responded affirmatively to both questions. Not only did all respondents indicate 'yes', they would recommend the course to a friend, they did so with enthusiasm –noting multiple people they would recommend the course to, and additional positive declarations. Respondents were equally enthusiastic about signing up again themselves.

Additionally, respondents were asked for recommendations and additional comments or feedback. There were 41 (74%) positive, 3 (5%) negative, and 12 (21%) neutral responses. Positive responses included reiteration of the skills learned and incorporated into daily life; numerous expressions of thanks; encouragement to continue the work/study and praise for the MBSR instructor; expressed positive changes in life; and repeated requests for more sessions/retreats/reunions.

> I hope other parents who feel they have a life sentence lose their shackles like I did. I hope this program can be experienced by others.

The three negative comments were all received from one respondent and centered around the MBSR instructor, 'I . . . didn't like his personality.' The neutral responses were suggestions for a change in schedule; a request for 'make-up' sessions in the event of missed sessions; e-mailing paperwork to save time; and other logistical suggestions.

Continued Mindfulness Practice

At post-treatment assessment, participants indicated their practice of mindfulness since the group ended as: nearly every day (30%); a few days a week (43%); about once a week (17%); and hardly ever, or not at all (9%). None of the participants had attended any other mindfulness group or retreat since the group ended.

DISCUSSION

A recent call for research specifically cited the need for controlled trials of mindfulness interventions with families of children with disabilities, in order to establish the feasibility and efficacy of this approach to improving parental and child adjustment (Whittingham, 2014). The purpose of the current study was to assess the feasibility of delivering standard MBSR with a diverse community-based sample of highly-stress parents of children with DD, as outlined in the corresponding manuals (Blacker et al., 2009; Kabat-Zinn, 2009). Despite the high levels of stress experienced by our sample, results suggest that this intensive intervention is feasible and well received by these parents.

The percentage of enrolled participants who continued to attend sessions until the end of the intervention (84.3%) is

TABLE 4
Progression of Mindfulness – Paired Samples *t*-Test

	Session 1 (mean ± SD)	Session 5 (mean ± SD)	Session 8 (mean ± SD)	*t*-statistic$_{1 \text{ vs } 5}$ (Cohen's *d*)	*t*-statistic$_{5 \text{ vs } 8}$ (Cohen's *d*)	*t*-statistic$_{1 \text{ vs } 8}$ (Cohen's *d*)
Observe	23.42 ± 5.06	26.64 ± 5.81	29.64 ± 4.79	3.05** (0.59)	2.32* (0.55)	4.36*** (1.29)
Describe	25.47 ± 6.71	26.19 ± 6.10	28.12 ± 6.44	0.88 (0.11)	2.79* (0.31)	3.20** (0.40)
Act with awareness	22.17 ± 5.21	23.97 ± 6.22	26.80 ± 4.96	1.71† (0.31)	3.49** (0.50)	4.09*** (0.91)
Non-judgmental	22.61 ± 6.61	25.72 ± 6.99	29.00 ± 5.71	3.25** (0.46)	3.13** (0.51)	5.28*** (1.03)
Non-reactive	17.97 ± 4.02	21.50 ± 3.40	24.20 ± 3.42	5.53*** (0.95)	2.99** (0.79)	6.55*** (1.67)

†$p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p<0.001$.

comparable to the mean completion rate of 85% reported by Baer (2003) in a review of mindfulness based interventions. This is also considerably higher attendance than was found in a previous similar study among parents of children with chronic illness, where 75% overall program attendance was deemed quite high given the demanding nature of parents' caregiving role (Minor et al., 2006). Additionally, when we only consider participants who actually started the intervention (n = 46), the completion rate is even higher (96%) with only three participants not continuing in the program. Thus, despite the numerous demands and stressors our families were undergoing, they were still able to complete this intervention and attend fairly consistently, satisfying this component of feasibility. Overall attendance was higher in the immediate treatment group than in the waitlist–control group. Some waitlist–control group participants reported preplanned vacations, which interfered with attendance of summer sessions. This was not a reason for missed sessions noted by participants in the immediate treatment group. Participants in both groups missed sessions due to illness and scheduling conflicts.

Parents with a history of stress made initial contact, demonstrating need and their subsequent enrollment and participation indicates that the intervention was a good fit. However, many of our participants may not have been able to attend the program without the $75 incentive, which helped offset the economic impact of driving considerable distances to the weekly sessions (see Methods section). Nonetheless, our participants not only attended, but also reported that they practiced techniques and utilized the mindfulness attributes learned in the MBSR groups. As participants gained skill and experience with the five facets of mindfulness, their self-reports of these attributes steadily increased as they progressed through the intervention. Of note, some of the facets of mindfulness changed quickly during the first part of the intervention (e.g., the ability to observe, notice and attend to one's experience sensations, perceptions, thoughts, and feeling as well as be non-judgmental and non-reactive to one's experience), while others improved more gradually (e.g., the ability to describe or label one's experience with words and acting with awareness and not operating on auto-pilot). Additionally, our findings indicated that parents practiced mindfulness outside of the MBSR session and that their use of mindfulness increased over the course of the group, indicating that the full 8-week intervention is warranted in order to see improvements in some components of mindfulness and to promote the ongoing practice of mindfulness.

The variability of mindfulness practice trajectories suggests that future research is needed to examine moderators of changes in mindfulness practice over the course of the group. Parents' endorsement of practicing mindfulness outside of sessions may be an indication that they were incorporating these skills into their everyday lives, which would thereby, enhance the effectiveness of this intervention over time. Also, most parents reported continuing to practice mindfulness 2–6 weeks after the intervention was completed. Most importantly, in addition to attending the MBSR sessions and learning mindfulness skills, parents were highly satisfied with their experience, with all parents who completed the program evaluation expressing that they were glad they had participated, would participate again if given the opportunity and would recommend it to other parents of children with DD.

Although results are encouraging, they must be interpreted within the context of several study limitations. This study focuses on the feasibility of delivering standard MBSR to parents of children with DD, but does not extend beyond the context of the research setting. Future research should include an analysis of program sustainability in a more typical clinical setting (Goddard & Harding, 2003) utilizing an interdisciplinary team. Additionally, 30% of the participants did not complete the program evaluation, which may have been due to absence during the final session or may represent participants who were dissatisfied with the intervention. Finally, although we found this intervention to be feasible, it may not be generalizable to other groups in various settings. Variables such as organizational and community climate may affect feasibility. Our study, set in the university behavioral health center was favorable to the intervention; providing adequate space, access to qualified staff, appropriate fit with existing prevention efforts, and favorable history with the community, which encouraged buy-in from key leaders and community members.

Future research is needed to examine the real-world feasibility of delivering a standard MBSR intervention. While our study supports the feasibility of delivering this intervention with a diverse community-based sample, the study was conducted in the context of a controlled research design. MBSR is an intensive intervention that requires highly trained instructors. Therefore, the feasibility of delivering this intervention to parents of children with DD in non-laboratory settings is still unknown. While efforts were made to remove obstacles, such as childcare, future investigators may wish to ask participants what could make the intervention even more user-friendly. Additionally, further qualitative studies should be undertaken to reveal the sacrifices parents made to participate and whether or not they thought it was worth it in the end. In other words, an in-depth qualitative approach is needed to understand the participants' perspective regarding practical feasibility and effectiveness. Finally, it will be important for future studies to examine whether an abbreviated form of MBSR may be equally effective and perhaps more feasible for parents of children with DD. Our study is a critical first step in establishing that standard MBSR is feasible for this population, given that this intervention has accrued the most empirical support (Carmody & Baer, 2009). It is important to examine the feasibility and efficacy of the standard intervention before making adaptations in order to be able to determine if the observed effects were a result of the MBSR intervention or the adaptations made. Nevertheless, some research has suggested that abbreviated MBSR interventions may also be effective for certain populations (Carmody & Baer, 2009; Klatt, Buckworth, & Malarkey, 2009), highlighting the need for future studies to examine the relationship between dose of

mindfulness intervention and outcome among parents of children with DD. Nevertheless, results from this pilot study are encouraging and indicate that MBSR interventions are feasible and should be tested in larger clinical trials with parents of children with DD.

In the previous work with this sample (Neece, 2013) and in the current investigation, participating parents reported extensive benefits of the intervention for themselves, their children, and families more broadly. These benefits have the potential to create lasting changes in their parenting, which may in turn have a positive effect on their child's behavior. The clinical significance of decreased parental stress requires further research to evaluate possible significance in overall health. However, this study provides clinicians with an evidence-based toolkit for ameliorating the tremendous stress and burden often experienced by parents of children with DD, which likely 'spill over' and improve the family's health. Nurses familiar with both the mental and physical health challenges these parents face have much to offer an interdisciplinary MBSR intervention team. In an interdisciplinary clinical setting, nurses can be alert for tell-tale signs and symptoms of stress. Therefore, nurses are an important first point of contact, and are integral to recruitment and retention of participants.

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REFERENCES

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

Altschuler, A., Rosenbaum, E., Gordon, P., Canales, S., & Avins, A. (2012). Audio recordings of mindfulness-based stress reduction training to improve cancer patients' mood and quality of life-a pilot feasibility study. *Supportive Care in Cancer, 20*(6), 1291–1297.

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*(12), 125–143.

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., et al. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment, 15*(3), 329–342.

Baker, B. L., Blacher, J., & Olsson, M. B. (2005). Preschool children with and without developmental delay: Behaviour problems, parents' optimism and well-being. *Journal of Intellectual Disability Research, 49*(8), 575–590.

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*(Parts 4/5), 217–230.

Bazzano, A., Wolfe, C., Zylowska, L., Wang, S., Schuster, E., Barrett, C., et al. (2013). Mindfulness-based stress reduction (MBSR) for parents and caregivers of individuals with developmental disabilities: a community-based approach. *Journal of Child and Family Studies*, DOI: 10.1007/s10826-013-9836-9.

Berg, B. L. (2009). *Qualitative research methods for the social sciences*. Boston, MA: Allyn and Bacon.

Blacker, M., Meleo-Meyer, F., Kabat-Zinn, J., & Santorelli, S. (2009). *Stress reduction clinic mindfulness-based stress reduction (MBSR) curriculum guide* (pp. 20). Center for Mindfulness in Medicine, Health Care, and Society. Worcester, MA: University of Massachusetts Medical School.

Bluffstone, R., Braman, M., Fernandez, L., Scott, T., & Lee, P. Y. (2008). Housing, sprawl, and the use of development impact fees: The case of the Inland Empire. *Contemporary Economic Policy, 26*(3), 433–447.

Bögels, S. M., Lehtonen, A., & Restifo, K. (2010). Mindful parenting in mental health care. *Mindfulness, 1*(2), 107–120.

Burton, P., Lethbridge, L., & Phipps, S. (2008). Children with disabilities and chronic conditions and longer-term parental health. *Journal of Socio-Economics, 37*(3), 1168–1186.

Carmody, J. & Baer, R. A. (2009). How long does a mindfulness-based stress reduction program need to be? A review of class contact hours and effect sizes for psychological distress. *Journal of Clinical Psychology, 65*(6), 627–638.

Chiesa, A. & Serretti, A. (2009). Mindfulness-based stress reduction for stress management in healthy people: a review and meta-analysis. *Journal of Alternative & Complementary Medicine, 15*(5), 593–600.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.), Hillsdale, NJ: Lawrence Erlbaum Associates.

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.

Corbin, J. & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Los Angeles, CA: Sage.

Crnic, K., 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.

Davis, D. & Hayes, J. A. (2011). What are the benefits of mindfulness? A practice review of psychotherapy-related research. *Psychotherapy, 48*(2), 198–208.

Dykens, E. (2012). Mindfulness-Based Stress Reduction: Overall findings from the Parent-Stress Intervention Project (PSIP). *Journal of Intellectual Disability Research, 56*(7/8), 737–737.

Dykens, E., 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.

Eisenhower, A. S., Baker, B. L., & Blacher, J. (2005). Preschool children with intellectual disability: Syndrome specificity, behaviour problems, and maternal well-being. *Journal of Intellectual Disability Research, 49*(Part 9), 657–671.

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.

Eisenhower, A. S., Blacher, J., & Baker, B. L. (2013). Mothers' perceived physical health during early and middle childhood: Relations with child developmental delay and behavior problems. *Research in Developmental Disabilities, 34*(3), 1059–1068.

Emerson, E. (2003). Mothers of children and adolescents with intellectual disability: Social and economic situation, mental health status, and the self-assessed social and psychological impact of the child's difficulties. *Journal of Intellectual Disability Research, 47*(Parts 4/5), 385–399.

Ferraioli, S. J. & Harris, S. L. (2013). Comparative effects of mindfulness and skills-based parent training programs for parents of children with autism: feasibility and preliminary outcome data. *Mindfulness, 4*(2), 89–101.

Gilliam, J. E. (1995). *Gilliam Autism Rating Scale*. Austin: Pro-ed.

Goddard, C. & Harding, W. (2003). *Selecting the Program That's Right for You: A Feasibility Assessment Tool*. Education Development Center, Inc. Retrieved from http://captus.samhsa.gov/sites/default/files/capt_resource/Feasibility tool kit – final version for printing.Mel__0.pdf (Accessed February 23, 2015).

Gold, S. & Ritsch, M. (2002). Swallowed by urban sprawl. *Los Angeles Times*.

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 of Mental Retardation, 111*(1), 48–61.

Hauser-Cram, P., Warfield, M. E., Shonkoff, J. P., & Krauss, M. W. (2001). Children with disabilities: A longitudinal study of child development and parent well-being. *Monographs of the Society for Research in Child Development, 66*(3), vii.

Johnson, N., Frenn, M., Feetham, S., & Simpson, P. (2011). Autism spectrum disorder: Parenting stress, family functioning and health-related quality of life. *Families, Systems, & Health, 29*(3), 232–252.

Josefsson, T., Lindwall, M., & Broberg, A. G. (2012). The effects of a short-term mindfulness based intervention on self-reported mindfulness, decentering, executive attention, psychological health, and coping style: Examining unique mindfulness effects and mediators. *Mindfulness, 5*(1),18–35.

Kabat-Zinn, J. (2013). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York, NY: Bantam Books.

Kelsey, J. L. (1996). *Methods in observational epidemiology*. New York, NY: Oxford University Press.

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.

Klatt, M. D., Buckworth, J., & Malarkey, W. B. (2009). Effects of low-dose mindfulness-based stress reduction (MBSR-ld) on working adults. *Health Education & Behavior, 36*(3), 601–614.

Minor, H. G., Carlson, L. E., Mackenzie, M. J., Zarnicke, 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.

Neece, C. L. (2013). 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, 23*(2).

Neece, C. L., Green, S., & Baker, B. L. (2012). Relationship between parenting stress and child behavior problems: An examination across time. *Journal of Intellectual and Development Disabilities, 113*(1).

Oelofsen, N. & Richardson, P. (2006). Sense of coherence and parenting stress in mothers and fathers of preschool children with developmental disability. *Journal of Intellectual and Development Disabilities, 31*(1), 1–12.

Olsson, M. B. & Hwang, C. P. (2001). Depression in mothers and fathers of children with intellectual disability. *Journal of Intellectual Disability Research, 45*(6), 535–543.

Olsson, M. B. & Hwang, C. P. (2008). Socioeconomic and psychological variables as risk and protective factors for parental well-being in families of children with intellectual disabilities. *Journal of Intellectual Disability Research, 52*(12), 1102–1113.

Praissman, S. (2008). Mindfulness-based stress reduction: A literature review and clinician's guide. *Journal of the American Academy of Nurse Practitioners, 20*(4), 212–216.

Robinson, E. A., Eyberg, S. M., & Ross, A. W. (1980). The standardization of an inventory of child conduct problem behaviors. *Journal of Clinical Child Psychology, 9*(1), 22–29.

Santorelli, S. (2014). *Mindfulness-based stress reduction (MBSR): Standards of practice*. The University of Massachusetts Medical School. Retrieved from http://www.umassmed.edu/cfm/index.aspx. (Accessed May 1, 2014).

Singer, G. H. (2006). Meta-analysis of comparative studies of depression in mothers of children with and without developmental disabilities. *American Journal of Mental Retardation, 111*(3), 155–169.

Singh, N. N., Lancioni, G. E., Winton, A. S., Singh, J., Curtis, W. J., Wahler, R. G., et al. (2007). Mindful parenting decreases aggression and increases social behavior in children with developmental disabilities. *Behavior Modification, 31*(6), 749–771.

Suárez, L. M. & Baker, B. L. (1997). Child externalizing behavior and parents' stress: The role of social support. *Family Relations, 46*, 373–381.

US Census Bureau. (2010). *United States Census 2010*. Washington DC: Author.

Whittingham, K. (2014). Parents of children with disabilities, mindfulness and acceptance: A review and a call for research. *Mindfulness, 5*, 704–709.