Mindfulness Activities and Interventions that Support Special Populations

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With tranquil restoration: - feelings too
Of unremembered pleasure: such, perhaps,
As have no slight or trivial influence
On that best portion of a good man's life,
His little, nameless, unremembered, acts
Of kindness and of love. nor less, I trust,
To them I may have owed another gift,
Of aspect more sublime: that blessed mood
In which the burden of the mystery,
In which the heavy and the weary weight
Of all this intelligible world,
Is lightened—that serene and blessed mood
In which the affections gently lead us on, -
Until, the breath of this corporeal frame
And even the motion of our human blood
Almost suspended, we are laid asleep
In body, and become a living soul:
While, with an eye made quiet by the power
Of harmony and the deep power of joy,
We see into the life of things.
Tintern Abbey, William Wordsworth, 1770–1850

Although the subject of Wordsworth's poem, "Tintern Abbey," is memory, it also serves to demonstrate the power of the mind to offer a "tranquil restoration" to the self which, in turn, alters mood and perceptions of the weight of the world, and enhances the ability to see the "life of things" that influence actions of "kindness and of love." These qualities of the mind and their potential benefits have not escaped the attention of professionals in the fields of psychology, general education, and medicine and are beginning to receive attention within the field of special education. Over the past decade, a body of literature has emerged examining the role of mindfulness with children, youth, and adults with special learning needs, and with their teachers and professional caregivers (for selected reviews of this literature see Chapman et al., 2013; Harper, Webb, & Rayner, 2013; Hastings & Manikam, 2013; Hwang & Kearney, 2013, 2014). This work is altering not only the skills and abilities of children with special needs but also the attitudes and beliefs of their teachers and professional caregivers. The aim of this chapter is to examine the practices of engaging in mindfulness with special populations and their teachers. This critical review attempts to take stock and evaluate what is of value of mindfulness with special populations and describe how mindfulness contributes to, in Buddhist philosophy, "the end of suffering," and our evolving acceptance of special needs in contemporary Western contexts.

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Acceptance of Experience

Mindfulness, as a practice, has been interpreted in educational contexts as a behavioral translation of Buddhist meditation. As such, mindfulness involves behaviors that include observing, describing with no judgment, and focusing awareness in the present moment (Kabat-Zinn, 1990). These behaviors, for special educators, represent a big departure from accepted practices. Our "evidence-base" resides predominantly in behaviorism, where the focus is on changing behavior and providing skills training. In contrast, the major emphasis of mindfulness training is on learning to experience emotions and thoughts skillfully, without evaluation and without the necessity of attempting to change or control the experience.

"Mindfulness is conceptualized as consisting of two facets: present-centered attention and acceptance of experience" (Coffey, Hartman, & Fredrickson, 2010, p. 250). Based on a study examining dispositional and mindfulness factors, Coffey et al. suggested that the ability to identify and differentiate among emotions, and to successfully regulate emotions are important consequences of the activity of mindfulness. Interestingly, when looking at how mindfulness contributes to well-being, they found that the acceptance of one's experience matters more for mental health than does present-centered attention. Acceptance of experience becomes an important notion in the context of special education, especially when we consider the struggle with the practice of *inclusion*. Inclusion of students with developmental disabilities with their same age peers has been on the agenda of special educators for decades (Jorgenson, 1997; Lyon et al., 2001; Shapiro, 1994). Yet, despite the agenda, in practice, there are still difficulties including children in school, as illustrated in the case below.

> *"Why is Bertrand sitting by himself with his iPad instead of interacting with the other students during group time?" I asked. As a special education inclusion consultant, I had a strong interest in encouraging Bertrand's teachers to include him in any activity that might allow him to practice his language and social interaction skills. His Educational Assistant replied, "Oh, he can't sit still during circle-time, he can't keep his hands and feet to himself, so it works out better for everyone if he has computer time on his own." "But he would really benefit from the social participation opportunities offered in the group," I countered. "Well, yes he would, but although he has a placement in this class," she explained, "we really have no idea how to manage his behavior, it is just too stressful everyone. He's not really ready to be included in this class."*

Some of the challenges including Bertrand in activities with his classmates relate to his non-normative behaviors but, beneath this, there is a suggested attitude that children need to be "ready" to be included. To be ready, one needs to behave in the "normative" way, a stance that insists that children adapt to the environment rather than adapt the environment to meet children's needs. This attitude of "readiness" is related to the lack of acceptance, or society's pervasive negative attitude to disability, dubbed "ableist" by Hehir (2007). Biklen (1992), who has written extensively about inclusion, has suggested that the purpose of special education is to "minimize the impact of disability and maximize the opportunities for students with disabilities to participate in schooling and the community" (p. 101). In the United States, the Individuals with Disabilities Education Act (IDEA; 1997, 2004) provides a mandate that requires individualized educational (IEP) teams address how students can gain access to the curriculum and how the school and teachers can meet the needs that arise out of students' disabilities. Yet, despite federally legislated mandates such as IDEA, problems remain in regard to including students in general education classrooms. From a mindfulness perspective, this could stem from a lack of acceptance of experience or a lack of acceptance of disability, itself. Acceptance could shift misguided effort to "cure" disability. Instead, if educators had enhanced ability to identify and differentiate among internal responses to children with disabilities, acceptance may lead to more accurate reflections on the kinds of supports, skills, and opportunities special students need to participate in school as fully as possible. Mindfulness provides an attitude that makes this kind of shift possible.

In the sections below, we review studies that have utilized mindfulness to influence a variety of outcomes. First, we examine mindfulness programs that address educator attitudes and beliefs that enrich well-being and acceptance. Second, we explore programs that address child behaviors or skills that impact upon improved coping in school environments.

Mindfulness Programs for Teachers and Professional Caregivers of Children with Special Needs

Beverly has been a special education teacher for the past 6 years. She used to feel idealistic about what she could accomplish as an educator but lately, she feels inundated by the number of students with special needs. Every year, it seems, more and more children with behavioral and educational needs are being placed in her classroom. This year, she has six of 28 children in her bustling grade 3 class with complex problems that need high levels of support. Robbie and Sean are diagnosed with ADHD and ODD respectfully; they are always getting into arguments and engaging in off task behaviours. It doesn't seem to matter if she lets them sit together or separates them, they always find a way to disrupt the learning of other students. Gemma has a diagnosis of autism spectrum disorder and requires a full time Educational Assistant. Despite not having a designation or Special Education 'code,' Amelia, Ben, and Thomas have learning challenges and it is hard to get them started with their school work. Beverly worries that she might not have the background or the support from the school administration to meet her students' needs. Although she loves her chosen profession, instead of getting easier, teaching seems to be getting harder and she often feels like she is at her wits end. She's really beginning to wonder if she made the correct career choice. Her husband and children have commented that she always seems frazzled and stressed about work rather than the enthusiastic and organized person she was when she first started teaching.

What Are the Issues? Beverly is in trouble. Her troubles are not the children that she has been assigned to teach but how she is coping with the social-emotional pressures of supporting these children on a day-to-day basis. Unfortunately, she is not alone. Many special education teachers like Beverly are at risk of leaving the teaching profession early. Attrition of special educators is on the rise due to a complex set of related circumstances. Billingsley (2003), in a study of the retention and attrition of special education teachers in the United States found that:

> Excessive and prolonged work problems lead to negative affective reactions, such as increased stress, lower job satisfaction, and reduced organizational and professional commitment….[this] clearly weakens the teacher's ability to be effective and therefore reduces their opportunities for the positive intrinsic rewards of teaching. (p. 6)

Mindfulness training may offer a solution; it is hypothesized to reduce biological vulnerability to negative emotional cues (Davidson et al., 2003), and research has demonstrated that those who practice meditation demonstrate activation of the brain that is consistent with improved capability in moderating the intensity of emotional arousal and increasing the experience of positive affect (Linehan et al., 2014). There are a handful of studies that have explored the effect of a mindfulness practice on reducing stress and enhancing well-being and work satisfaction for teachers or professional caregivers who work with high needs populations. These studies are summarized in Table 11.1 and discussed below.

Examples of Programs and Research

Benn et al. (2012) describe the implementation of a 5-week mindfulness program, *SMART-in-Education* (Cullen & Wallace, 2010), that included both special education teachers and parents of children with special needs. *SMART-in-Education*, or *Stress Management and Relaxation Techniques*, is a 36-h program developed to offer the same components of the Mindfulness-based Stress Reduction program (MBSR; Kabat-Zinn, 1990) with additional content that addresses emotion regulation, forgiveness, and kindness, and compassion as it relates to parenting and teaching. In an efficacy trial, teachers and parents who took part in the program reported increased mindfulness in terms of being more present, less judgmental, and more descriptive of their moment-to-moment experiences in contrast to the comparison group. The authors

Table 11.1 Examples of studies examining mindfulness for teachers or professional caregivers of children and youth with special needs

Author(s)	Participants (*N*)	Mindfulness activity	Outcomes targeted	Methodology and findings
Benn, Akiva, Arel, and Roeser (2012)	Special education teachers (23)	*SMART-in-Education* (Cullen & Wallace, 2010)	Mindfulness:	Randomized Waitlist Control
	Parents of children with special needs (20)	– 36 h of didactic and group discussion, mindfulness practices, and homework assignments delivered over nine 2.5 h sessions and 2 full days in a 5 week period	– *Five Facet Mindfulness Questionnaire* (FFMQ; Baer et al., 2006)	In contrast to the comparison group, participants who experienced the program self-reported increased mindfulness in terms of being more present, less judgmental, and more descriptive of their moment-to-moment experiences. Authors determined that these mindfulness competencies mediated reductions in participant's stress and distress with program effects persisting and growing larger in two-month follow-up. Both teachers and parents reported more positive well-being and enhanced relational competence. Teachers reported greater teaching self-efficacy but parents did not report enhancement in parenting efficacy or parent–child interactions
		– Compared with a no treatment control	Well-Being:	
			– *Perceived Stress Scale* (PSS; Cohen et al., 1983)	
			– *State-Trait Anxiety Inventory (S-TAI*; Kendall et al., 1976)	
			– *Centre for Epidemiological Studies Depression (CES-D*; Radloff, 1977)	
			Personal Growth:	
			– *Psychological Well-Being* (three items; Ryff & Keyes, 1995)	
			– *Self-Compassion Scale (SCS*; Neff, 2005)	
			– Positive and Negative affect: (*PANAS*; Watson et al., 1988)	
			– *State Forgiveness Scale* (Brown & Phillips, 2005)	
			– *Interpersonal Reactivity Index (IRI*; Davis, 1983)	
			Vocational Behaviors:	
			– Teaching Self-Efficacy (Midgely et al., 2000)	
			– Parenting Self-efficacy: *Everyday Parenting Scale* (Dunst & Masiello, 2002)	
			– Quality of parent–child interaction: items from the *Parenting Stress Inventory (PSI*) as described by Zaidman-Zait et al. (2010)	

Bethay, Wilson, Schnetzer, Nassar, and Bordieri (2013)	Staff (psychologists, special education teachers and assistants, care staff, nurses, social workers) from a state funded facility that offers 24 h care for individuals with moderate to severe intellectual disabilities	Combined *Acceptance and Commitment Training (ACT; Bond & Hayes, 2002) and Applied Behavior Analysis (ABA) (n = 18) contrasted with only ABA (n = 16)*	Psychological distress:	Randomized Control Study
		– *Three 3 h sessions @ 1 week intervals*	– *General Health Questionnaire-12* (Goldberg, 1978)	Participants in the ACT + ABA group who reported significant psychological distress at pretest exhibited larger reductions in distress than those who received ABA alone. As well, ACT + ABA participants reported a decrease in the believability of thoughts that are indicative of burnout when compared to the ABA group. The two groups did not differ in the reported frequency of thoughts and feelings that are indicative of burnout consistent with the ACT program model, which emphasizes a reduction in the functional impact of thoughts rather than altering their form or frequency
			Vocational Behaviors:	
			– *Maslach Burnout Inventory, Human Services (MBI*; Hastings et al., 2004) and *Burnout Believability Scale (BBI*; Bach & Hayes, 2002)	

(continued)

Table 11.1 (continued)

Author(s)	Participants (*N*)	Mindfulness activity	Outcomes targeted	Methodology and findings
Brooker et al. (2013)	Staff employed at residential service homes for adults with disabilities (managers = 22; support staff = 12, total *N* = 34)	*Occupational Mindfulness (OM) Program* (Adapted from *Mindfulness-Based Cognitive Therapy* (*MBCT;* Segal, Williams, & Teasdale, 2002), *MBSR* (Kabat-Zinn, 1990), and Seligman (2002) positive psychology	Mindfulness:	Quasi-experimental pre-post one group design
		2 h sessions × 8 weeks; sessions included focused group work and 40 min homework per 6/7 days	– Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006)	Significant increases in positive affect and the mindfulness facet of observing on the FFMQ. Paradoxically, participants reported enhanced awareness of signs and sources of stress and anxiety, yet positive changes in self-care attitudes and behaviors and interactions with clients and colleagues. More positive attitudes and behavioral changes were reported by support workers than managers. Overall, the program developers concluded that the program yielded a range of benefits to participants and holds significant potential to be transferred to other work settings
			Well-being:	
			– *Perceived Stress Scale* (PSS; Cohen et al., 1983)	
			– *Depression Anxiety Stress Scale—21* (DASS-21; Lovibond & Lovibond, 1995)	
			– PANAS; Watson et al., 1988)	
			– *Satisfaction with Life Scale* (SWL; Diener, 1985)	
			– SCS; Neff (2003)	
			Vocational Behaviors:	
			– *Copenhagen Burnout Inventory* (CBI; Kristensen et al., 2005)	
			– *Minnesota Satisfaction Questionnaire—Short Form* (MSQ-SF; Weiss et al., 1967) for job satisfaction	
			– *Professional Quality of Life Scale* (ProQOL; Stamm, 2009)	
			– *Santa Clara Brief Compassion Scale* (SCBCS; Hwang et al., 2008)	

Jennings, Frank, Snowberg, Coccia, and Greenberg (2013)	Classroom teachers ($n=33$), special education teachers ($n=8$), specialists (e.g., speech and language pathologists) ($n=6$), non-core educators ($n=3$).	*Cultivating Awareness and Resilience in Education (CARE;* Jennings, Snowberg, Coccia, & Greenberg, 2011)	Mindfulness:	Randomized control trial
	Total $N=50$	– 30 h program in day long sessions over 4–6 weeks	– FFMQ; Baer et al. (2006)	Results suggest that CARE had significant positive effects on teachers' general well-being, efficacy, burnout/ time pressure, and mindfulness. Teachers who participated in the CARE program described improved ability to "reappraise" stressful situations, a behavior that is associated with emotional regulation. They also reported that improved daily physical symptoms of stress co-occurred with an improved sense of efficacy as a teacher. Like other teachers who participated in mindfulness programs, CARE teachers reported improved observing and non-reacting on the mindfulness measures. Overall, participants reported high levels of satisfaction with the program
		– Intersession coaching and booster session 2 months post program	Well-Being:	
		– Blend of didactic, interactive, and experiential activities	– *PANAS*; Watson et al. (1988)	
		– Emotion skills, mindfulness/stress reduction, and compassion practices	– Emotion Regulation Questionnaire (ERQ: Gross & John, 2003)	
			– CESD-20; Radloff et al., (1977)	
			– Daily Physical Symptoms (DPS; Larson & Kasimatis, 1997)	
			Vocational Behaviors:	
			– Teacher's Sense of Efficacy Questionnaire (TSES; Tsannen-Moran & Woolfolk Hoy, 2001)	
			– MBI; Hastings et al., (2004)	
			– Time Urgency Scale (TUS; Landy et al., 1991)	
			Program Evaluation:	
			– CARE Acceptability	
			Questionnaire (CAQ: Jennings et al., 2013)	

determined that these mindfulness competencies mediated reductions in participants' stress and distress, with program effects persisting and increasing in 2-month follow-up. Additionally, both teachers and parents reported more positive well-being and enhanced relational competence with their children. Importantly, the teachers reported greater teaching self-efficacy and felt better able to gauge how to regulate their response to stressful events. This application of a mindfulness program for special education teachers demonstrated that teachers can develop strategies for stress reduction that generalize to many settings, not only to their classrooms but in other contexts of their life, as well.

Other research has paired teacher training in applied behavioral analysis (ABA), an evidenced-based approach to working with children with special needs (Wong et al., 2014), with a form of mindfulness training called Acceptance and Commitment Therapy (ACT; Bond & Hayes, 2002). The researchers were curious whether ABA training could be enhanced by providing teachers with methods to not only help students with special needs but also to better cope with their personal stress and feelings of burnout related to working with children with additional needs (Bethay et al., 2013). They found that among participants who prior to the program reported significant psychological distress, teachers trained in both ACT and ABA exhibited larger reductions in distress than those who received ABA alone. As well, the ACT + ABA participants reported a decrease in the believability of thoughts related to burnout when compared to the ABA participants. The two groups did not differ significantly in the reported frequency of thoughts and feelings that are indicative of burnout. This finding was consistent with the ACT program model, which emphasizes a reduction in the functional impact of thoughts rather than altering their form or frequency.

Another mindfulness program, developed for staff employed at a residential treatment center for adults with significant disabilities, sought to address staff's response to the range of stressors experienced in the workplace. The program, Occupational Mindfulness (OM; Brooker et al., 2013) combined aspects of Mindfulness-based Cognitive Therapy (Segal et al., 2002), MBSR (Kabat-Zinn, 1990), and Martin Seligman's work in positive psychology. Participants, both support workers and their managers, were provided with structured opportunities for core mindfulness practices and were encouraged to make daily use of a "breathing space" in the workplace and assigned "homework" to establish mindfulness practices in their daily living. At the conclusion of the 8-week program, the researchers found significant increases in positive affect and the mindfulness facet of "observing." Participants reported enhanced awareness of the signs and sources of stress and anxiety which may have been perceived as a negative outcome; however, this awareness was paired with positive changes in self-care attitudes and behaviors and interactions with clients and colleagues. The support workers rated the program positively, a factor that could be related to their attitude and behavior changes. Overall, the program developers concluded that the program yielded a range of benefits to participants and holds significant potential to be transferred to other work settings.

Probably one of the most rigorous studies examining the benefits of mindfulness for teacher educators comes from a recent randomized control trial of the *Cultivating Awareness and Resilience in Education* (*CARE*; Jennings et al., 2011) program (Jennings et al., 2013). While the trial did not exclusively study special educators, they were included in the participant pool. After the 6 week 30-h program, results from teacher self-report measures suggest that CARE had significant positive effects on teachers' general well-being, efficacy, burnout/time pressure, and mindfulness. Teachers who participated in the CARE program described improved ability to "reappraise" stressful situations, a behavior that is associated with emotional regulation. They also reported that daily physical symptoms of stress decreased and co-occurred with an improved sense of efficacy as a teacher. Like other teachers who participated in mindfulness programs, CARE teachers reported improved

observing and non-reacting on the mindfulness measures. Overall, participants reported high levels of satisfaction with the program.

What does this research tell us? First, the studies represent an interesting new direction in teacher professional development programs that recognizes that wellness is associated with performance and effectiveness as a teacher. Like our teacher Bev introduced at the beginning of this section, stress and burnout is a serious problem in education today. For special educators, stress is compounded by repeated exposure to challenging behaviors (Koritsas, Iacono, Carling-Jenkins, & Chan, 2010), uncertainty in how to teach some children, and low resources or administrative support to meet student educational needs (Billingsley, 2003). A focus on programs that help teachers reduce stress and bolster well-being, acknowledges the reality of school settings and allows teachers to develop better observational skills of themselves in their circumstances that potentially allows them to respond to student needs more empathically and appropriately, thereby freeing them up to maximize their pedagogical skills with high needs populations.

Mindfulness Programs for Students with Special Needs

James is a 7-year-old boy with attention deficit hyperactivity disorder who attends a rural primary school. He is an affectionate young person who is delayed but progressing well in grade three, except for physical education class. There, he needs a lot of support just to stay in the gym and attend to the teacher. His mother has commented that her son finds the gym over stimulating and he has difficulty focusing in that kind of environment. James is rarely away from school and physical education at his school is scheduled every day.

Jordan is well behaved and sociable in his community, especially when he is in the company of his family. At school, he is able to complete grade level material with particular strengths in math. He finds school a stressful environment and complains to his mother that 'no one likes him' and that his teacher changes the schedule without enough warning. He sometimes refuses to go to school and, even when he is there, he will not participate in activities, saying that he prefers to work alone. His current teacher, Mr. Laughlin, is aware that Jordan is on the autism spectrum and, additionally, sees him as an anxious student who he has referred to the Learning Resource teacher for some social supports.

Lisa is a 14 year-old junior high student who is attends the resource room at her school. Her teacher, Ms. Kirkpatrick, has felt frustrated by Lisa's obsessive-compulsive behaviours and is not sure what to do about them. She says that Lisa becomes angry when she does not provide constant reassurance or when something in the resource room is out of order. Despite regretting her behavior afterward, Lisa often yells and threatens the teacher and the other students, disrupting the learning environment. Lisa has a mild intellectual disability diagnosis and a history of depression, so Ms. Kirkpatrick wants to tread carefully.

What Are the Issues? James, Jordan, and Lisa each have very unique needs. Like many children with mild to moderate disabilities, they find the school environment stressful and unpredictable and are challenged by the work demands at school. It is not uncommon for students with developmental disabilities to respond to the school context with range of maladaptive behaviors: to withdraw, to be noncompliant, and to be aggressive (Allen, 2000). Teachers need to seek ways to reduce student maladaptive behaviors, as they are clearly barriers to benefiting from learning opportunities (Hattie, 2009). Within the special education literature, there are many established treatments for maladaptive behaviors, including functional analysis, antecedent supports, functional communication training, and differential reinforcement, to name a few (Wong et al., 2014). Behavioral treatments have been criticized as, although they are successful in highly controlled context, when fidelity wanes, so too does their effectiveness (Singh et al., 2013). With mindfulness emerging as a promising coping procedure within the typical population, it is not unreasonable to assume that it may be beneficial for individuals with intellectual disabilities and other learning needs (Hwang & Kearney, 2013). Research that has explored the potential of mindfulness to enhance learning outcomes for students with special needs is presented in Table 11.2 and described below.

Table 11.2 Examples of studies examining mindfulness for children, youth, and adults with special needs

Author(s)	Participants (*N*)	Mindfulness program	Outcomes targeted	Methodology and findings
Adkins, Singh, Winten, McKeegan, and Singh (2010)	Adults with one or more of the following diagnoses (*N* = 3):	*Meditation on the Soles of the Feet* (Singh et al., 2011)	Behavior	Multiple baseline across participants
		• Training to shift attention from emotion or trigger prior to behavior	"Maladaptive Behavior"	For all participants the frequency of maladaptive behaviors decreased from the pre-intervention baseline phase to the mindfulness intervention phase and remained low, with mild variability, 9–12 weeks after the intervention
	• Obsessive Compulsive Disorder, Depression, and/or Intellectual Disability	• 1 h, 5 days a week from 2 to 5 weeks; incidental practice encouraged	• Verbal aggression	
		• Support provided by a trained community-based therapist	• Work disruption	
			• Physical aggression	
			• Property destruction	
			• Rectal digging	
			• Urinary Incontinence	
Beauchemin, Hutchins, and Patterson (2008)	Adolescents aged 13–18 years (*N* = 34):	Mindfulness Meditation (based on *Wherever you go there you are* (Kabat-Zinn, 1994))	Social Skills, Problem Behaviors, & Academic Performance:	Quasi-experimental Design
	• Learning disabilities	• Teachers trained in 2 h session	– *Social Skills Rating System* (Gresham & Elliot, 1990)	(Pre-post; no-control; no follow-up)
		• Teachers provided students with 5–10 min of mindfulness meditation for several times a day, 5 days per week for 5 weeks	Mental Health:	Teachers rated improved student social skills and academic performance. Students self-reported decreased anxiety following the mindfulness program. No long-term follow-up
			– *State-Trait Anxiety Inventory* (Spielberger et al., 1970)	
Carboni, Roach, and Fredrick (2013)	Children with Attention Deficit Hyperactivity Disorder who were on medication for challenging behaviors (*N* = 4)	*MBSR for Children* (Saltzman & Goldin, 2008) and CD of recorded practices from *Building Emotional Intelligence to Cultivate Inner Strength in Children* (Lantieri & Goldin, 2008)	Behavior	Multiple baseline across participants
		• Individual session for 30–45 min per day for 10–20 sessions	– "On task behaviors" in classroom settings ratings based on the *Behavioral Observations of Students in Schools* (BOSS; Shapiro, 2004)	The modest increases of on-task behavior that occurred for all participants during the intervention phase returned close to baseline at 2-week follow-up

Haydicky, Wiener, Badali, Milligan, and Ducharme (2012)	Adolescent males (12–18 years) with Learning Disabilities (LD) ($N=60$)	*Mindfulness Martial Arts* (MMA; Badali, 2007)	Executive Functioning	Quasi-experimental waitlist control design
	– Subgroups:	• Manualized program; 1.5 h session each week for 20 weeks	– *Behavior Rating Inventory of Executive Functioning; (BRIEF*; Gioa, Isquith, Guy, & Kenworthy, 2000)	In contrast to the waitlist control group, parents reported reductions in externalizing, oppositional behaviors, and conduct problems for their children with LD and ADHD. Parents also reported that their boys with LD + Hyperactive/impulsivity showed improvements in social problems and the executive functioning skill of monitoring. Boys with inattentiveness improved on parent rated social problems. Boys with LD and elevated anxiety self-reported reductions in anxiety
	LD + ADHD (47 %)	• Elements of mindfulness, Cognitive Behavior Therapy, and mixed martial arts	Behavioral Symptoms	
	LD + Hyperactive/impulsive (48 %)		– *Child Behavior Checklist (CBCL*; Achenback & Rescorla, 2001)	
	LD + Anxious/Shy (48 %)		– *Youth Self-Report (YSR*; Achenback, 2001)	
	LD + Inattentive (55 %)			
Idusohan-Mozier, Sawicka, Dendle, and Albany (2013)	Adults with mild to moderate intellectual disabilities and at least one mental health concern (i.e., depression, anxiety, or self-injurious behavior) ($N=12$)	Program adapted from *Mindfulness-based cognitive behavior therapy* (MBCT; Segal et al., 2002); *Acceptance and Commitment Therapy (ACT*; Hayes et al., 1999; self-compassion (Neff, 2003); and *Meditation on the Soles of Your Feet* (Singh et al., 2003)	Well-being:	Quasi-experimental design (pre- post; no control; 6-week follow up)
		• Adapted for adults with intellectual disabilities	– *The Compassion Scale*; (Neff, 2003)	Improvements in participant's self-reported compassion and kindness for themselves and others, however follow-up scores were closer to baseline. Participant interviews on the HADS revealed that anxiety was reduced at posttest and this difference remained at follow-up. Depression scores were significantly lower at posttest; however, the difference was not maintained at follow-up. Those that completed the program (approximately 80 %), positively rated the experience yet slightly less than half reported that they would continue the practices learned
		• Group ran for 1.5 h for 9 weeks; follow up 6 weeks post intervention	Mental Health:	
		• Caregivers of the adults also attended the sessions and were invited to encourage daily practice	– *Hospital Anxiety and Depression Scale* (HADS; Zigmond & Snaith, 1983)	

(continued)

Table 11.2 (continued)

Author(s)	Participants (*N*)	Mindfulness program	Outcomes targeted	Methodology and findings
Miodrag, Lense, and Dykens (2012)	Adults with Williams Syndrome and Borderline or Mild Intellectual Disability (*N*=24)	*Mindfulness-Based Stress Reduction* (MBSR) (adapted from Kabat-Zinn, 1990)	Biological:	Quasi-experimental (pre-post; no control group; no follow-up)
		• Program conducted during a week-long camp; small-group sessions; 20 min per day for 5 consecutive days	– Physiological measures associated with stress: Salivary cortisol and Salivary Enzyme Alpha-Amylase (sAA)	As hypothesized, self-reported anxiety and salivary cortisol were associated at the start of each MBSR session. Importantly, both the salivary cortisol and self-reported anxiety were reduced at the end of each session. MBSR did not have a main effect on sAA, which were variable from session to session
			Behavioral Symptoms	
			– Mood Rating Scale (developed by study authors)	
Singh et al. (2013)	Adult Smokers with Mild Intellectual Disability (*N*=3)	*Meditation on the Soles of the Feet* (Singh et al., 2011)	Behavior	Changing Criterion Design (12 month maintenance and 3 year follow-up)
		• Phase I: 3 month 10–15 min daily meditation practice; daily monitoring of cigarettes smoked	– Number of cigarettes smoked	All three participants reduced smoking from 13–38 to 0 cigarettes per day over a period of 77–165 days. Nonsmoking was maintained for all participants after 3 years
		• Phase II: Daily intention to quit smoking; gradual reduction of cigarettes smoked; daily mindful observation of thoughts; meditation of the Soles of the Feet role play 30 min a day for 5 days, guided to use when urge to smoke was strong; 10 days of practice assignments		
Singh et al. (2013)	Adults with Mild Intellectual disability and low frequency but severe aggressive behaviors (*N*=34)	*Meditation on the Soles of the Feet* (*SoF*; Singh et al., 2011)	Behavior	Randomized waitlist control
		• Taught by parents and community support staff for 12-week for 15–30 min per day	– Physical and verbal aggression	After the SoF intervention, there were observed reductions in both physical and verbal aggression. Fidelity of program implementation, evaluated by certified SoF trainers, was high indicating potential for transfer for SoF to community settings
		• SoF program: meditation; focused attention on arousal states; Meditation on the Soles of the Feet practice in simulated incidents		

Singh et al. (2007)	Adults with mild to moderate intellectual disability and comorbid mental health disorder ($N=3$)	Two meditation procedures were taught: *Meditation on the Soles of the Feet* (Singh et al., 2011) and *Recreating-the-scene* (Van Houten & Rolider, 1988)	Behavior	Multiple-baseline across participants
		• Practices were taught, then two practice session per day were supported for 35 weeks	– Physical aggression (e.g., punching, kicking, slapping, or hitting with object)	All three participants reduced aggressive behaviors and maintained reductions at 2-year follow-up. These changes allowed the participants to continue living in their community placements
Singh et al. (2011)	Adolescents (age 14–17) with autism spectrum disorder who had previously been prescribed medication or whose parents had received behavioral training ($N=3$)	*Meditation on the Soles of the Feet* (Singh et al., 2003)	Behavior	Multiple-baseline across participants
		• Taught by participant's mothers for 30-min for 5 consecutive days followed by practice of skills twice a day until behavior was eliminated for 4 consecutive weeks	– Physical aggression towards a sibling or parent (e.g., hitting, kicking or biting)	All three participants reduced aggressive behaviors to near zero incidences and were able to maintain reductions at three-year follow-up. Mothers, who taught the intervention, also reported using *SoF* meditation when they felt stressed
Spek, van Ham, and Nyklicek (2013)	Adults with autism spectrum disorder who were also experiencing symptoms of depression, anxiety and/or rumination ($N=42$)	*Mindfulness-Based Therapy for Autism Spectrum* (MBT-AS) (adapted from *Mindfulness-based cognitive therapy* (MBCT; Segal et al., 2002)	Well-being	Randomized Control Design
		• Small group 2.5 h sessions for 9 weeks with encouragement to practice 40–60 min a day 6 days a week. Guided meditations were provided in audiofiles	– *The Dutch Global Mood Scale* (Denollet, 1993)	Following the mindfulness-based intervention, participants self-reported decreases in anxiety, depression, and rumination with medium to large effects. Further, the intervention group showed an increase in positive affect in contrast to the control group
			Mental Health	
			– *The Symptom Checklist-90-Revised* for anxiety and depression (Derogatis, 1994)	
			– *Rumination-Reflection Questionnaire* (Trapnell & Campbell, 1999)	

(continued)

Table 11.2 (continued)

Author(s)	Participants (*N*)	Mindfulness program	Outcomes targeted	Methodology and findings
Van der Oord, Bogels, and Peijnenburg (2012)	Parents and their children (age 8–12 years) with Attention Deficit Hyperactivity Disorder (ADHD) (*N* = 22)	Two programs, Mindful Parenting (MP) and Mindful Child Training (MCT) were developed by the authors based on MBCT (Segal et al., 2002) and MBSR (Kabat-Zinn, 1990) with adaptations for ADHD children (i.e., clear structure, breaks, tangible reinforcement for compliance)	Behavioral Symptoms – Disruptive Behavior Disorder Rating Scale (Pelham et al., 1992)	Quasi-experimental waitlist control Parents who participated in the program self-rated reductions of their own ADHD behavior, parenting stress, and overreactivity and improvements in mindfulness awareness
		• Program was conducted in small groups of parents or children (with some joint sessions) for 90 min over 8 weeks	Mindfulness – *Mindfulness Attention and Awareness Scale* (MAAS; Brown & Ryan, 2003) Parenting – *Parenting Stress Index*; De Brock et al., 1992) – *The Parenting Scale* (Arnold et al., 1993) – ADHD Rating Scale (parent); Kooij et al., 2005)	Parents reported child improvements of inattention and hyperactivity/impulsivity. Teacher ratings revealed mild improvements in child inattention; however, no further teacher ratings were found to be statistically significant. Almost 20 % of the participants did not complete the program

van de Weijer-Berjsma, Formsma, de Bruin, and Bogels (2012)	Parents and their children (age 11–15 years) with Attention Deficit Hyperactivity Disorder (ADHD) ($N = 10$)	Two programs, *Mindful Parenting* (MP; Bogels et al., 2008; Van der Oord et al., 2012) and *Adolescent Training (AT),* were developed by the authors. Both programs were inspired by Mindfulness in Schools (Hubbard & Johnson, 2010). To enhance learning, home practice and enhancements were used	Mindfulness	Quasi-experimental design (one group pretest/ posttest with follow-up)
		• Parent (with fathers and mothers) and adolescent programs were held concurrently for 8 weekly 90-min sessions	– MAAS (Brown & Ryan, 2003)	No change was found in mindful awareness self-ratings for either adolescents or parents. Adolescents did not report that fatigue or happiness changed as a result of the program. Mixed reports (i.e., parents and /or teacher reports differed) of improvements in attention and reductions in externalizing and internalizing behaviors. Teachers reported that adolescents had better behavior regulation post program, indicating improvements in executive functioning. There were inconsistencies in response to the computerized attention tasks, preventing attribution of changes to the program. Fathers reported reductions in parental stress but mothers did not
			Behavior Symptoms	
			– *CBCL, YSR, and Teacher Report Form (*Achenback & Rescorla, 2001)	
			– Finders Fatigue Scale (Gradisar et al. 2007)	
			– Subjective Happiness Scale (Lyubomirsky & Lepper, 1999)	
			Executive Functioning	
			– *BRIEF* (Gioa et al., 2000)	
			Computerized Attention Tests	
			– Amsterdam Neuropsychological Tasks (attention, impulsivity, and reaction speed) (De Sonne-ville, 2005)	
			Parenting	
			– *PSI* (De Brock et al., 1992) and PS (Arnold et al., 1993)	

(continued)

Table 11.2 (continued)

Author(s)	Participants (*N*)	Mindfulness program	Outcomes targeted	Methodology and findings
Zylowska et al. (2008)	Adolescents ($n=8$) and adults ($n=24$) with ADHD	*Mindfulness Awareness Practices for ADHD* (developed by the authors and informed by Kabat-Zinn, 1990; Segal et al., 2002)	Behavioral Symptoms	Quasi-experimental design (one group, pre-post test)
		• Once per week 2.5 h sessions and daily at home practice for 8 weeks	– ADHD rating scale IV; (DuPaul, 1990) and the SNAP-IV; Swanson, 1995)	Improvements in ADHD symptoms, anxiety, and depressive symptoms were found following the mindfulness-based intervention. Improvements on cognitive tasks that measured attention and cognitive inhibitions were also found
			– Beck Anxiety Depression Indexes; (Beck, Epstein, &Brown, 1992)	
			– Child Depression Inventory; Kovacs, 1992)	
			Cognitive Functioning	
			– The Attention Network Test (ANT; Golden, 1978)	
			– STROOP Task	
			– Trail Making Test (Reitan, 1979)	
			– Digit span on the WISC-3; (Weschler, 1981, 1991)	

Examples of Programs and Research

Of the 14 studies present in Table 11.2, the strongest methodologically are five studies conducted by Nirbhay Singh and his team at the ONE Research Institute in North Carolina (i.e., Adkins et al., 2010; Singh et al., 2007, 2011, 2013). This program of research is commendable for the procedures that were followed to develop the mindfulness practice, *Meditation of the Soles of the Feet (SoF)*, and to test its effectiveness. *SoF* is a practice that is taught to help students recognize the precursors of behaviors or emotions that give rise to maladaptive behavior (e.g., aggression, anger, smoking), to disengage their attention to these precursors, and redeploy their attention to a neutral point in their body, the soles of their feet (Singh et al., 2013). To test the effectiveness of this intervention the research team began by utilizing single-case research designs (SCRD). There is high heterogeneity among the individuals within each of the disability groups. This diversity and the range of abilities and needed interventions makes SCRD a very appropriate research methodology to test program effectiveness. SCRDs are considered the first level of research used to establish the merit of a particular treatment or intervention. SCRD designs provide clear, visual evidence that an independent variable (i.e., such as a mindfulness program) has a replicable effect across a small number of participants (Smith et al., 2007). When there are positive findings, multiple SCRDs can strengthen initial findings by replicating the results across participants with varying needs, abilities, and challenges. Once SCRD studies establish the efficacy of a practice, experimental designs that test the intervention in more controlled ways, such as randomized control trials, are pursued. In the body of work of Nirbhay Singh, we see this carefully planned progression of research. Using a series of SCRD studies he and his team established the effectiveness of the SoF practice to address several maladaptive behaviors in a range of students: anger in an individual with intellectual disability and mental health issues (Singh et al., 2003), aggression in individuals with moderate levels of intellectual disability (Singh et al., 2007), a range of maladaptive behaviors in individuals with and obsessive compulsive disorder or depression (Adkins et al., 2010), aggression in autism (Singh et al., 2011), and smoking cessation in adults with intellectual disability (Singh et al., 2013). These studies helped to refine the adaptations needed to make the *SoF* practice suitable for these populations and establish the efficacy of the procedures. Following these initial studies, the research team moved on to an experimental design that tested the *SoF* practice on aggression in individuals with intellectual disability in a more controlled clinical randomized control trial (Singh et al., 2013). Intervention effects of the SoF practice were observed in decreases in aggression and anger episodes, decreases in maladaptive behaviors, and smoking cessation. Singh et al. (2013) provides an explanation of why the SoF is likely effective: "Given that the mind cannot fully concentrate on two nonhabitual processes simultaneously (Foerde et al., 2006), the *SoF* meditation results in the fading of the anger or emotionally arousing situation. In essence, the individual learns to stop, focus the mind on the body, calm down, be in the present moment, and then make an informed response to the situation, without anger" (p. 164).

Modifications of several mindfulness programs (e.g., MBSR (Kabat-Zinn, 1990), MBCT (Segal et al., 2002), ACT (Bond & Hayes, 2002), and Mindfulness in Schools (Hubbard & Johnson, 2010) to increase the accessibility of the procedures for children and youth with ADHD (Carboni et al., 2013; Van der Oord et al., 2012; van de Weijer-Berjsma et al., 2012; Zylowska et al., 2008), autism (Spek et al., 2013), learning disabilities (Beauchemin et al., 2008; Haydicky et al., 2012; Milligan & Ducharme, 2012), and intellectual disabilities and mental health concerns (Idusohan-Mozier et al., 2013), and Williams Syndrome (Miodrag et al., 2012). Program effects have been mixed but overall positive with reductions in anxiety, depression, and rumination and improvements in social skills, academic performance, executive functioning, well-being, and on task behavior. One study (Miodrag et al., 2012) found that salivary cortisol was associated with reductions in self-reported

anxiety at the end of each mindfulness session but cautioned that, "We do not know how this would translate into longterm stable effects" (p. 143).

What does this research tell us? This growing body of research, the majority of which has been published in the last 5 years, indicates a belief that people with disabilities can and do benefit from programs that are more "psychological" in nature, as long as adaptations are made to increase accessibility (Idusohan-Mozier et al., 2013). As such, the effects of the application of mindfulness have been observed in the seemingly disparate conditions of ASD, intellectual disabilities, ADHD, mental health concerns, and other developmental issues. Positive outcomes have been seen through behavioral changes, decreased anxiety, better focus and attention at school, and improvements in well-being and attitudes toward school. However, these positive findings need to be considered with caution. Many of the studies described above include small samples or use weak designs (i.e., pre-post test with no comparison group). In addition, with the exception of the unique *SoF* meditation (i.e., Adkins et al., 2010; Singh et al., 2007, 2011, 2013), no research addresses the issue of which components of the mindfulness program influence the changes observed or were perceived by the participants as the most meaningful. Few studies explore long-term impact of the program (with the exception of Singh et al., 2013) and whether the students are able to maintain the mindfulness practices without adult supports. Knowledge of whether and for whom supports are needed may add to future successful applications of mindfulness programs and approaches with special populations

Conclusions and Future Directions

The research on mindfulness programs that have been offered to special education teachers and professional caregivers is promising. Effects of the programs include reductions in stress and "burnout," more effective "reappraisal" of situations and high acceptance of the programs by teachers. Programs that contribute to teacher wellness are likely to have far reaching consequences, especially in regard to student outcomes. There is a well-established relationship between teacher attitudes toward their teaching and their effectiveness as teachers (Osher et al., 2007) and teacher quality is highly associated with student outcomes (e.g., Allen, Pianta, Gregory, Mikami, & Lun, 2011; Hamre & Pianta, 2005). Whether or not enhanced mindfulness practices influence teacher attitudes of acceptance toward students with disabilities is suggested but the exact mechanisms of how mindfulness can contribute to shifts in interactions with these students requires further exploration. Several researchers caution that it is likely that short duration programs may not be sufficient to establish a mindfulness "practice" that will sustain enhanced coping and response to stressful workplace settings. Other supports within the workplace or school setting may need to be established in order to support teacher practices in this regard. Clearly more research is needed in this area.

For children with special needs, mindfulness appears to have positive outcomes, especially in regard to decreased anxiety, improved on task behavior, and decreased depression and rumination. This review reveals that mindfulness is a promising approach for delivering needed supports for students with special needs. Given the complexities involved with the development and evaluation of such programs, it is not surprising that empirical support for them is still quite limited. While there are promising effects for some targeted developmental issues, more work is needed to specify who will benefit from mindfulness programs and how the positive effects can endure and translate to other settings. In order for mindfulness to be adopted by students, schools, and other agencies, future research must continue to demonstrate efficacy, effectiveness, and social validity across large diverse samples of individuals and contexts.

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