

# A Promising Practice: School-Based Mindfulness-Based Stress Reduction for Children with Disabilities

Wendy W. Fuchs

Southern Illinois University Edwardsville

Nancy J. Mundschenk

Southern Illinois University Carbondale

Brian Groark

Southern Illinois University Edwardsville

## Abstract

Adults and children around the world are experiencing unhealthy levels of stress. More specifically, the stress levels that children report can have detrimental effects on their social-emotional, physical and academic well-being. Schools are in a unique position to not only address the causes of stress in children's lives, but to also provide strategies to reduce stress. Mindfulness-Based Stress Reduction (MBSR) is one approach that schools can use to teach children how to acknowledge and deal with everyday stressors. This article aims to provide a definition of stress, describe MBSR, and provide a review of the current literature on MBSR studies with children. Additionally, the authors suggest implications for school-based mindfulness approaches to reduce the stress of children with disabilities, and recommendations for future research.

*Key Words:* Mindfulness-based strategies, mindfulness practices, special education

---

## SCHOOL-BASED MINDFULNESS-BASED STRESS REDUCTION

Global organizations concerned with the general well-being of people everywhere have found not only that stress among adults is rising and causing physical symptoms (Global Organization for Stress, 2016; International Stress Management Association, 2016), but that children around the world also experience elevated levels of stress on a daily basis (American Psychological Association, 2015; International Stress Management Association, 2016). Globally, children experience stress generated by traumatic events such as war, natural disasters, and the difficulties related to immigration. Other children may not have experienced extreme life events but may still experience social or

academic stress that is potentially harmful to their social-emotional well-being and academic achievement.

One popular definition of stress is “a condition or feeling experienced when a person perceives that demands exceed the personal and social resources the individual is able to mobilize” (American Institute of Stress, 2016).. In this article, the focus is on the negative psychological and social responses reflected in The International Stress Management Association's use of Lazarus' definition of stress as “a physical, psychological or social dysfunction that leaves individuals feeling unable to bridge the gap with the requirements or expectations placed upon them” (1999). In other words, it is not only the body or mind's response to a demand or expectations, but more specifically

the response when the person feels that they are unable to meet or cope with that demand.

Children and adults do not understand or respond to stress in the same ways. Children may experience stress from events or experiences that seem insignificant to adults (Kaneshiro, 2014). In addition, Bagdi and Pfister (2006) reported that children often experience life stressors in multiple contexts of their environment (e.g., home, school, peer relationships), and some children rely on ineffective coping styles making it difficult for them to appropriately deal with challenging life circumstances. Their ability to deal with stress within the academic environment is particularly important given the significant amount of time they spend in the school setting. As Sotardi (2013) showed, students experience situations in school that may increase their levels of stress, and in those situations they may exhibit decreased self-control, self-awareness, and self-esteem (Flook et al, 2010). Therefore, children who are not able to appropriately and adequately manage stress are at risk for negative outcomes based on their inability to deal with the stressful conditions of everyday life.

Coping with stress may be even more problematic for students with disabilities, who already face a variety of other challenges (Mammarella et al, 2014). A student with Autism Spectrum Disorder (ASD), for example, with deficits in social communication skills may act out due to his/her inability to deal with the social stressors inherent to school contexts. Many other students with disabilities experience negative social interactions because they do not know how to properly deal with stressors arising from their deficits. Mammarella et al. (2014) reported that students with disabilities, when compared to peers without disabilities, reported higher levels of stress when interacting with teachers and peers, and tended to report higher instances of emotional, behavioral, or physiological reactions to stressors. Specifically addressing physical symptoms, students with disabilities tend to exhibit significantly more occurrences of stomachaches and headaches as well as getting into fights, talking back to their teachers, yelling at their classmates and acting out in class (Helms, 1996) in response to stressful situations. Students with disabilities, then, need access to effective methods of coping with stress.

One possible method is enhanced mindfulness, and this article examines research on the effectiveness of mindfulness training in this regard. Specifically, this article provides a general description of Mindfulness-Based Stress Reduction (MBSR), a review of current literature available on school-based use of MBSR, potential benefits of MBSR in school-based practice for students with disabilities, and recommendations for future research on mindfulness techniques for students with disabilities around the world.

## Mindfulness-Based Stress Reduction

MBSR is a program that was created by Jon Kabat-Zinn in 1979 at the University of Massachusetts Medical Center for patients who experienced chronic and acute pain (Kabat-Zinn, 2013). Initially, the program targeted hospital patients with conditions that doctors felt could not be improved through traditional methods (e.g., medication, surgery), but the breadth of its application has been expanded and applied to the stressful situations of everyday life, including in the schoolroom.

Mindfulness training can be defined as the intentional focus of one's attention to the present moment in order to increase awareness of the presence and power of those specific, identifiable mental processes that may generate negative emotions or behaviors (Bishop et al., 2004). More specifically, MBSR uses the following definition of mindfulness: "paying attention on purpose, in the present moment, and nonjudgmentally, to the unfolding of experience moment to moment" (Kabat-Zinn, 1994, p. 4). Similarly, Burke (2014) describes mindfulness training as allowing an individual to become aware of the present moment, or state of being, objectively and without judgment. This contrasts with how individuals often perceive their worlds, which typically consists of "a process of monitoring and comparing an idea of how things are (or anticipated to be) with an idea of how things should be, or ought to be" (Burke, 2014, p. 150). Through mindfulness training, individuals learn to deal more effectively with life stressors by first becoming more fully aware of how their own mental processes sometimes generate inappropriate or exaggerated negative emotions. In so doing, they enable themselves to shift their attention away from those detrimental reactions without judgment, and therein open themselves to discovering more effective, productive, and adaptive ways of dealing with stress. In essence, MBSR training grants individuals the ability to acknowledge positive and negative emotions, thoughts, and experiences in a neutral, nonjudgmental manner, and then use that ability to find more beneficial patterns of response.

There are various kinds of mindfulness techniques (e.g., breath awareness, body awareness, positive thought generation, focus on gratitude, word repetition, or guided imagery) that typically share a common goal: a frequent or daily practice whereby practitioners become physically still (often times in a seated position), who then focus their attention on a single word, object, or mental task in order to relieve the mind of its normal active, rapid-thinking state (Kabat-Zinn, 1994). Some people accentuate the distinctions between different types of mindfulness techniques, but for the purposes of this article, the general MBSR definition and strategies are the focus.

In a typical 8-week MBSR course for adults, participants learn seated meditation (breath awareness or body

scan), mindful movement (simple yoga poses and walking meditation), and mindful eating (Kabat-Zinn, 2013). Many programs that have been adapted for school-aged children focus mostly on breath awareness, body scan and simple yoga poses (Broderick & Metz, 2009). There is great emphasis on attending to the present moment, and bringing nonjudgmental awareness to whatever arises during these sessions. The primary goal of MBSR is to provide participants with strategies to enable them to become more comfortable within their own minds and bodies. Although relaxation or a sense of calm can often be the result of MBSR, it is not the primary objective (Wolf & Serpa, 2015).

## REVIEW METHODOLOGY

The first step in identifying studies to be included in this article was an analysis of an existing comprehensive review of mindfulness research conducted by Black (2015) Based on review of Black's summary of over 3000 references to empirical studies of mindfulness, the following parameters were used: (a) the study included children or youth, (b) the intervention was consistent with the practices of the specific approach used in Mindfulness-Based Stress Reduction Program (Kabat-Zinn, 2013), and (c) social-emotional outcomes were a dependent measure.

The review conducted by Black (2015) included searches of terms such as *youth*, *child*, *adolescent* and *mindfulness*, *mindfulness meditation*, and *mindfulness-based* in publications from 1966-2013. The selection criteria Black used included studies with participants who were under 19 years of age, and studies that tested a mindfulness-based intervention. Of the studies reviewed for the above criteria, 41 studies were included in Black's review. For the purpose of this article, the authors excluded any studies that solely measured physical symptoms such as heart rate and blood pressure, or studies that used Mindfulness-Based Cognitive Therapy (MBCT). From the 36 studies that met Black's criteria and the additional criteria of using MBSR adapted programs, an additional 10 were excluded from review for this article because the studies used measured physical symptoms, or other mindfulness-based programs that do not adhere to the MBSR core strategies.

After determining the inclusion criteria for studies from Black's review, an additional search for any citations in 2014 and 2015 that met both Black's original review criteria and the additional criteria for this article was conducted and five more citations were identified. A total of 31 studies were identified for inclusion in this article. Table 1 presents a summary of the studies obtained categorized by setting and type, and provides the sample size, age and population, and findings for each study in this review.

Of the 31 studies, 15 were conducted in schools, eight of which used randomized control trials, four were school-based nonrandomized control trials, and four studies

worked with established groups or cohorts. Of the 16 studies conducted in a clinical setting, four were randomized control trials, 11 used a cohort model, and one study was a clinic-based case study.

## RESULTS

### Effectiveness of Mindfulness-Based Stress Reduction Training

Most MBSR empirical research has been conducted with adult populations. Many studies examined the physiologic effects of mindfulness training on the neurobiological systems in individuals (Davidson & Kabat-Zinn, 2003) and its usefulness when incorporating MBCT in counseling to reduce psychopathology (Teasdale et al., 2000). Grossman, Niemann, Schmidt, and Walach (2004) concluded that mindfulness-based methods are useful in treating a number of characteristics common to various disabilities, including psychological and physical symptoms. In a meta-analysis of mindfulness training studies, Hofmann, Sawyer, Witt, and Oh (2010) determined that mindfulness techniques were effective in reducing depressive and anxious symptoms in individuals with or without psychological disorders. Studies have also shown mindfulness training to be an effective means of reducing stress-related symptoms in a wide range of children, from those with minor anxiety to those with diagnosed disorders of anxiety and depression (Liehr & Diaz, 2010; Mendelson et al., 2010; Napoli, Krech, & Holley, 2005; Lau & Hue, 2011; Beauchemin, Hutchins, & Patterson, 2008; Joyce, ETTY-Leal, Zazryn, & Hamilton, 2010; Biegel, Brown, Shapiro, & Schubert, 2009).

**School-based randomized control trials.** Seven of the 31 studies were done in schools with randomized control trials, and they measured students' self-reported improvements in social-emotional stress (i.e., anxiety, rumination, intrusive thoughts). Three of the seven studies focused the mindfulness-based interventions on ethnically diverse populations (Liehr & Diaz, 2010; Mendelson et al., 2010; van de Weijer-Bergsma, Langenberg, Brandsma, Oort, & Bögels, 2014). The participants ranged from 7-15 years old and were considered healthy (Flook et al., 2010; Liehr & Diaz, 2010; Mendelson et al., 2010; Napoli et al., 2005; Sibinga, Perry-Parrish, Chung, Johnson, Smith, & Ellen, 2013; Sibinga, Webb, Ghazarian, & Ellen, 2016; van de Weijer-Bergsma et al., 2014). Students in the intervention group in each of the seven studies reported increased positive outcomes (e.g., improved executive functioning, attention) and decreased negative symptoms (e.g., depressive feelings, test anxiety). In one study (Flook et al., 2010), improvements in behavioral regulation, metacognition and general executive functioning were reported by parents and teachers to be greater for children with executive functioning difficulties in the 8-week mindfulness intervention group compared with controls. In

Table 1  
Description of MBSR Studies for School-aged Children

<i>Study</i>	<i>N</i>	<i>Age range</i>	<i>Sample</i>	<i>Relationship to Comparison Group</i>
<b>School-Based MBSR and RCT</b>				
<i>Flook et al. (2010)</i>	64	7-9 years	Healthy	MT group showed significant increases the ability to plan and regulate behaviors. Most significant improvements seen with individuals with lowest executive functioning skills at baseline.
<i>Liehr et al. (2010)</i>	18	9-10 years	Ethnic minority	MT group showed significant reductions in depressive and anxious symptoms.
<i>Mendelson et al. (2010)</i>	98	Grades 4-5	Ethnic minority	MT group showed improved control over involuntary responses to negative stimuli.
<i>Napoli et al. (2005)</i>	194	Grades 1-3	Healthy	MT group had decreased social and functional deficits and self-reported less test-anxiety and increased visual attention.
<i>Sibinga et al. (2013)*</i>	41	Grades 7-9	Healthy males	Males who participated in the MBSR program had reductions in anxious feelings, decreased fixation on negative thoughts, and increased coping skills.
<i>Sibinga et al. (2016)*</i>	300	Grades 5-8	Healthy	MT group had decreased negative physical and mental symptoms, as well as increased coping skills.
<i>van de Weijer-Bersgma et al. (2014)</i>	199	8-12 years	Healthy, ethnically diverse	Based on child- and parent-reports, MT group showed significant improvements in coping with negative feelings; most significant results seen in highest impairment at baseline.
<b>School-based MBSR NCT</b>				
<i>Broderick &amp; Metz (2009)</i>	137	16-19 years	Healthy females	MT group reported improvements in somatic feelings, general mood, and thoughts related to mindfulness (e.g., self-acceptance, calmness).
<i>Coholic et al. (2012)</i>	21	8-14 years	Behavior disorders	MT youth self-reported improved ability to recognize and control one's reactions to emotions.
<i>Lau &amp; Hue (2011)</i>	48	14-16 years	Low achieving	MT group decreased scores on depression and anxiety scales, as well as increased ratings of mindfulness and personal growth.
<i>Schonert-Reichl &amp; Lawlor (2010)</i>	246	9-13 years	Healthy	MT group showed self-reported improvements in general outlook and teacher-reported improvements in independent functioning (i.e., on-task behaviors).
<b>School-based MBSR Cohort</b>				
<i>Beauchemin et al. (2008)</i>	34	13-18 years	Learning disabled	MT associated with reduced symptoms of anxiety and teacher-reported decreases in negative behaviors.
<i>Black &amp; Fernando (2014)</i>	409	K- grade 6	Low SES ethnic minority	MT associated with improvements student behaviors over time, per teachers' reports.

Table 1, continued

<i>Study</i>	<i>N</i>	<i>Age range</i>	<i>Sample</i>	<i>Relationship to Comparison Group</i>
<i>Joyce et al. (2010)</i>	141	10-12 years	Healthy	MT associated with reductions in externalizing and internalizing social/emotional problems.
<i>van de Weijer-Bergsma et al. (2012)</i>	10	11-15 years	ADHD	MT associated with improvements in executive functioning, attention, and behavioral problems.
<b><i>Clinic MBSR RCT</i></b>				
<i>Biegel et al. (2009)</i>	102	15-16 years	Outpatient psychiatry	MT group showed improvements in internalizing mental problems and sleeping habits; clinicians rated better prognosis for MT group compared to controls over time after intervention.
<i>Jee et al. (2015)*</i>	42	N/A	Children in foster care	Modifications for shorter MT program showed limited effects. Longer exposure to program was hypothesized to be more effective with traumatized youth.
<i>Hilt &amp; Pollak (2012)</i>	102	9-14 years	Healthy	MT and distraction training both reduced fixation on negative thoughts after negative mood induction.
<i>Sibinga et al. (2014)*</i>	20	12-21 years	Outpatients at pediatric clinic	Self-reports resulted in insignificant effect; qualitatively, MBSR participants had increased mindfulness.
<b><i>Community/Clinic MBSR Cohort</i></b>				
<i>Barnert et al. (2014)</i>	29	14-18	Incarcerated males	MT group showed improvements in self-regulation of internalizing thoughts and feelings (e.g., impulsivity, stress), but results did not reach significance.
<i>Britton et al. (2010)</i>	55	16-17 years	Substance abuse	Female MT completers showed reduced substance-abuse problems after 20-week program; frequency of mindfulness practice associated with feelings of self-efficacy.
<i>Haydicky et al. (2012)</i>	60	12-18 years	Learning disabled	MT group improved on parent-rated negative behaviors, including non-compliant, defiant, and aggressive behaviors.
<i>Himmelstein et al. (2012)</i>	32	14-18 years	Incarcerated ethnic minority	MT associated with improvements self-efficacy of emotion- and stress-control.
<i>Kerrigan et al. (2011)</i>	10	13-19 years	African American high risk for HIV	MT associated with self-reported qualitative ratings of mindfulness skills.
<i>Sibinga et al. (2008)</i>	5	13-21 years	African American HIV+	MT associated with self-reported qualitative ratings of mindfulness skills.

Table 1, *continued*

<i>Study</i>	<i>N</i>	<i>Age range</i>	<i>Sample</i>	<i>Relationship to Comparison Group</i>
<i>Sibinga et al. (2011)</i>	33	16 years	HIV+ at risk	MT associated with reduced negative and aggressive feelings; qualitative improvements observed in general social, academic, and personal functioning.
<i>Tan &amp; Martin (2013)</i>	10	14-17 years	Psychiatric outpatient	MT completers improved mindfulness skills and psychological functioning. Parents rated improved child behavior. Results maintained and/or improved at follow-up.
<i>van der Oord et al. (2012)</i>	22	8-12 years	ADHD	MT group self-reported greater use of mindfulness. Parents and teachers reported decreased symptoms of ADHD (i.e., inattentive and hyperactive/impulsive behavior).
<i>Waltman et al. (2012)</i>	7	14-17 years	Disruptive behavior disorder	MT program participants reduced noncompliant behaviors, with approximately half maintaining improvements post-treatment.
<i>Zylowska et al. (2008)</i>	8	15-16 years	ADHD	MT associated with improvements in ADHD symptomatology and; however, results failed to generalize to adult populations.
<b><i>Community/Clinic Case Studies</i></b>				
<i>Freedenberg et al.* (2015)</i>	10	15 years	Adolescents with implantable pacemakers	MBSR completers saw improvements in anxious feelings.

Note. N= 31 studies. MT, mindfulness training; MBSR, mindfulness-based stress reduction.

\* Studies not included in Black's original review (2015).

addition, data collected on both teacher and parent reports of behavioral change suggest that the improvements generalized across settings. Liehr and Diaz (2010) compared the impact of a 2-week mindfulness intervention with a standard health education intervention that included a stress-reduction component, on self-reported depression and anxiety in children from Caribbean and Central American countries. Children randomly assigned to the mindfulness instruction reported lower levels of depressive symptoms compared to children in the health education intervention. These findings point to the potential value of mindfulness practices for children with challenges to executive functioning or social emotional difficulties.

**School-based nonrandomized control trials.** Four of the 31 studies measured adolescents' self-reports of general feelings of well being (e.g., aches/pains, sense of calmness; Broderick & Metz, 2009; Lau & Hue, 2011), optimism, and attention (Schonert-Reichl & Lawlor, 2010), and improved emotional reactivity (Coholic, Eys, & Lougheed,

2012). In each of these studies, participants reported improvements in each of the measured domains compared to those students in the control group. For example, Lau and Hue (2011) indicated that, when compared to control students, Chinese adolescents aged 14 to 16 years old exposed to a six-week school-based mindfulness program showed significant improvements in depressive symptoms and personal growth (i.e., one dimension of well-being). Although not statistically significant, improvements were reported in perceived stress indicating that students exposed to the mindfulness program were able to reduce symptoms of depression and stress, and thus to adapt and personally grow despite life stressors inherent to adolescence.

Schonert-Reichl and Lawlor (2010), who taught teachers to implement a Mindfulness Education (ME) program (i.e., a universal preventative intervention) to Canadian students in 4th to 7th grades, provided further evidence of the feasibility and effectiveness of school-based mindfulness programs. Compared to students in a wait-list



control group, students exposed to the ME program showed significant improvements in teacher-rated social and emotional functioning as well as self-rated optimism (Schonert-Reichl & Lawlor, 2010). It should also be noted that teachers were able to implement the ME program with high fidelity, which adds credence to the feasibility of incorporating mindfulness-based interventions in school contexts.

**School-based cohort studies.** Four studies examined self-reported changes in anxiety and depression after completing mindfulness-based interventions. In a 5-week mindfulness meditation intervention for adolescents with learning disabilities (Beauchemin et al., 2008), program completers reported reduced short-term and long term responses to anxiety, and teacher ratings showed an increase in positive classroom behavior (e.g., self-control, paying attention, caring for others). Similarly, Black and Fernando (2014) found that teacher ratings of students' behavior (e.g., paying attention, caring for others) improved after implementing a 5-week mindfulness-based program for 15 minutes, three times per week for students from lower socio-economic status and ethnic minority backgrounds. In a 10-week mindfulness program for 10-12 year olds in Australia, participants indicated a decrease in depressive symptoms and emotional problems (Joyce et al., 2010). In the Netherlands, adolescents with Attention-Deficit Hyperactivity Disorder (ADHD) showed a decrease in emotional and behavioral problems and improvements in executive functioning and attention after an 8-week school-based mindfulness training sessions (van de Weijer-Bergsma et al., 2012).

**Clinical or community-based studies.** Four of the 31 studies were conducted in a clinical setting. Biegel et al., (2009) provided evidence of the clinical efficacy of a mindfulness-based stress reduction (MBSR) program. Individuals being treated for a number of diagnoses in an outpatient clinic were assigned to either the treatment-as-usual group (control) or the mindfulness-based intervention group (MBSR). All participants in the MBSR group reported greater improvements than those in the control group in anxiety, depressive symptoms, self-esteem and somatization. Two studies implemented mindfulness programs for children with significant life challenges such as living in foster care (Jee et al., 2015) and pediatric hospitalizations (Freedenberg, Thomas, & Friedmann, 2015; Sibinga et al., 2014). Completers of the 3-week MBSR program did not show statistical significance, but participants from the pediatric clinic studies reported a greater sense of calm and an increased self-awareness. The authors hypothesize that youth who have experienced severe trauma would benefit from a longer-lasting program (Jee et al. 2015). One additional clinical study examined healthy children, ages 9-14 and found that participants in the mindfulness-training group had reduced rumination

compared to the group that did not receive the training (Hilt & Pollak, 2012).

Of the 11 studies conducted in community or clinic settings, 5 of the studies focused on populations with severe challenges including youth who were incarcerated, in residential facilities, or receiving treatment for substance abuse, or outpatient therapy (Barnert, Himmelstein, Herbert, Garcia-Romeu, & Chamberlain, 2014; Britton et al., 2010; Himmelstein, Hastings, Shapiro, & Heery, 2012; Tan & Martin, 2013). Three of the studies examined the effects of mindfulness-based interventions with African-American participants with HIV or at high risk for acquiring HIV (Kerrigan et al., 2011; Sibinga et al., 2008; Sibinga et al., 2011). Two of the 11 studies used a combination of parent and teacher rating scales, as well as self-reports of the effect of MBSR on youth with a documented disability such as ADHD, behavior disorder, or Learning Disability (Haydicky, Wiener, Badali, Milligan, & Ducharme, 2012; van der Oord, Bögels, & Peijnenburg, 2012; Waltman, Hetrick, & Tasker, 2012; Zylowska et al., 2008). Parents and teachers reported improvements in conduct and externalizing behavior problems (van der Oord et al., 2012) and behaviors (e.g., impulsivity, inattention, hyperactivity) associated with ADHD (Haydicky et al., 2012; Zylowska et al., 2008).

### Potential Benefits to Children and Adolescents

Students exposed to a school-based mindfulness program may well develop coping skills to help alleviate everyday stressors that inhibit social and emotional functioning. In doing so, children learn practices that improve not only their social/emotional well-being in school, but may also promote positive experiences in contexts outside of school. In other words, children who learn how to effectively deal with stress within the school environment are likely to generalize these skills to other areas of their lives. As such, given the effectiveness mindfulness training has been shown to have with adults in reducing stress-related symptoms, techniques in mindfulness may prove equally useful when applied to younger populations.

For example, preliminary clinical trials of a 6-week mindfulness training program applied to five children with anxiety 7 to 8 years old proved the feasibility and acceptability of such an approach in reducing levels of anxiety, while increasing levels of attention related to improvements in symptom severity (Semple, Reid, & Miller, 2005). Semple, Lee, Rosa, and Miller (2010) also demonstrated that mindfulness-based cognitive therapy improved and sustained the attention ability of a diverse group children aged 9 to 13 years old, who displayed improvements in behavior problems and anxiety symptoms. These children in the MBSR group self-reported decreased symptoms of anxiety, depression, and somatic distress and improved self-esteem and sleep quality. The

self-reports were validated when clinicians blind to treatment group rated those exposed to MBSR as having greater improvements than those in a control group in their psychological symptoms and overall ability to deal with problems. From the results of these clinical studies, mindfulness-based interventions appear to have potential positive benefits for younger populations, especially those experiencing psychological symptoms that may negatively affect their ability to function properly in their respective environments.

Mindfulness programs in school-settings are often implemented with a combination of students with and without disabilities. Students with disabilities commonly exhibit higher levels of stress, and more frequent instances of negative emotional and behavioral reactions to environmental stressors (Mammarella et al., 2014). With mindfulness strategies, individuals with disabilities may learn useful ways to become more aware of their emotional and behavioral responses to stressful situations, and thereby develop greater ability to manage negative reactions to stress more effectively. For example, mindfulness practices show promise in benefitting individuals with anxiety disorders and ASD, who often suffer from an inability to successfully cope with environmental stressors. Individuals with ADHD and those who show impulsive tendencies might benefit from mindfulness techniques that teach self-management skills, especially since these individuals often have trouble regulating sudden impulses. Students with emotional or behavior disorders could potentially learn mindfulness practices that would not only help decrease anger and aggression, but might also serve to interrupt the emotional escalation process that sometimes culminates in detrimental and damaging behaviors.

### Implications of School-Based Applications

Felver, Doerner, Jones, Kaye, and Merrell (2013) acknowledged the potential feasibility of implementing mindfulness techniques within existing school systems that provide a continuum of supports to address students' needs. The authors believe:

Mindfulness practice and intervention can take various forms, depending on the needs of the individuals and the contexts in which these persons function. As a direct intervention for students, the intensity and method of integration would be tailored to meet the needs of the student or students under consideration (p. 536).

As such, mindfulness techniques could be rather easily incorporated into schools to provide all students with useful methods to deal with everyday stressors, as well as interventions for students with significant emotional and behavioral challenges. While there is a growing body of research on the effects of mindfulness on adults, specific considerations exist for the implementation of mindfulness practices with children in a school setting. For example,

when applying interventions that have largely been effective with adult populations, Felver et al. (2013) concluded that simply making adult materials more *child friendly* would not suffice to make the training developmentally appropriate. Instead, specific modifications need to be made when applying mindfulness techniques to adolescents in schools such as reducing the length of intervention time, incorporating multiple sensory stimuli (e.g., hearing, tasting, touching) into procedures, and explaining difficult concepts using metaphors or concrete examples.

Given the importance of prosocial strategies for dealing with stress-related symptoms, school personnel are well situated to support students' acquisition of mindfulness practices that can be utilized beyond the school setting. Mindfulness training for students with disabilities can be integrated into existing school structures, courses, and schedules, and students exposed to these types of trainings can apply lessons learned to stressors experienced at home and in other community settings. The school programs described above are not context-specific, and they allow schools to incorporate mindfulness practices in ways that align with their needs, schedules, and unique cultures. This flexibility argues for the feasibility of integrating mindfulness practices in schools around the world so that all children might glean the benefits of these universal practices while maintaining the unique differences of their cultures and school structures.

### Recommendations for Future Research

There is limited experimental research on the application of mindfulness-based techniques to students in general, and an even greater dearth of research on the effect of these techniques on students with disabilities. Hence, while school-based mindfulness strategies have been shown to be acceptable and feasible (e.g. Broderick & Metz, 2009; Fuchs, 2014; Joyce et al., 2010; Mendelson et al., 2010), future researchers are called to continue to test the usefulness of mindfulness-based interventions when applied in academic settings, especially when the goals are to reduce the levels of stress and increase students' coping skills. Further, research is also needed to determine if mindfulness techniques have differing levels of effectiveness in students with and without disabilities.

Finally, while many of the current and past studies cited in this article have been conducted in clinical settings within the United States, it should be of particular interest to future researchers and school personnel, on a global scale, to produce replicable findings that will serve to increase the reliability and validity of school-based mindfulness practices in providing much needed social and emotional support to students with disabilities around the world. Mindfulness training, then, will become more widely accepted as an evidence-based practice when



quantitative studies continue to document measurable and reliable reductions in specific negative behaviors, and when improvements in the ability to manage stress are shown, regardless of geographic location.

## REFERENCES

- American Institute of Stress (2016). Daily life: Definitions. Retrieved from <http://www.stress.org/daily-life/>
- American Psychological Association (2015). *Stress in America survey*. Retrieved from <http://www.apa.org/news/press/releases/stress/2015/highlights.aspx>
- Bagdi, A. & Pfister, I. K. (2006). Childhood stressors and coping actions: A comparison of children and parents' perspectives. *Child & Youth Care Forum, 35*, 21-40. doi: 10.1007/s10566-005-9001-8.
- Barnert, E. S., Himelstein, S., Herbert, S., Garcia-Romeu, A., & Chamberlain, L. J. (2014). Innovations in practice: Exploring an intensive meditation intervention for incarcerated youth. *Child and Adolescent Mental Health 19*(1), 69-73.
- Beauchemin, J., Hutchins, T. L., & Patterson, F. (2008). Mindfulness meditation may lessen anxiety, promote social skills, and improve academic performance among adolescents with learning disabilities. *Complementary Health Practice Review, 13*(1), 34-45.
- Biegel, G. M., Brown, K. W., Shapiro, S. L., & Schubert, C. M. (2009). Mindfulness-based stress reduction for the treatment of adolescent psychiatric outpatients: A randomized clinical trial. *Journal of Counseling and Clinical Psychology, 77*, 855-866. doi: 10.1037/a0016241.
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmondy, J., . . . Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*, 230-241. doi: 10.1093/clipsy/bph077.
- Black, D. S. (2015). Mindfulness training for children and adolescents: A state-of-the-science review. In K. W. Brown, J. D. Creswell, & R. M. Ryan (Eds.), *Handbook of mindfulness: Theory, research, and practice* (pp. 283-310). New York, NY: Guilford Press.
- Black, D. S., & Fernando, R. (2014). Mindfulness training and classroom behavior among lower-income and ethnic minority elementary school children. *Journal of Child and Family Studies, 23*(7), 1242-1246.
- Britton, W. B., Bootzin, R. R., Cousins, J. C., Hasler, B. P., Peck, T., & Shapiro, S. L. (2010). The contribution of mindfulness practice to a multicomponent behavioral sleep intervention following substance abuse treatment in adolescents: A treatment-development study. *Substance Abuse, 31*(2), 86-97.
- Broderick, P. C., & Metz, S. (2009). Learning to BREATHE: A pilot trial of a mindfulness curriculum for adolescents. *Advances in School Mental Health Promotion, 2*(1), 35-46.
- Brown, A. P., Marquis, A., & Guiffrida, D. A. (2013). Mindfulness-based interventions in counseling. *Journal of Counseling & Development, 91*, 96-104.
- Burke, C. (2014). An exploration of the effects of mindfulness training and practice in association with enhanced wellbeing for children and adolescents. In F. A. Huppert & C. L. Cooper (Eds.), *Wellbeing: A complete reference guide, volume VI* (pp. 141-184). Chichester, West Sussex, UK: John Wiley & Sons Ltd.
- Case-Smith, J., & Sines, J. S. (2010). Perceptions of children who participated in a school-based yoga program. *Journal of Occupational Therapy, Schools, & Early Intervention, 3*, 226-238. doi: 10.1080/19411243.2010.520246.
- Coholic, D., Eys, M., & Lougheed, S. (2012). Investigating the effectiveness of an arts-based and mindfulness-based group program for the improvement of resilience in children in need. *Journal of Child and Family Studies, 21*(5), 833-844.
- Davidson, R. A., & Kabat-Zinn, J. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine, 65*, 564-570.
- Felver, J. C., Doerner, E., Jones, J., Kaye, N. C., & Merrell, K. W. (2013). Mindfulness in school psychology: Applications for intervention and professional practice. *Psychology in the Schools, 50*, 531-547. doi: 10.1002/pits.21695.
- Flook, L., Smalley, S., Kitil, M. J., Galla, B., Kaiser-Greenland, S., Locke, J., Ishijima, E., & Kasari, C. (2010). Effects of mindful awareness practices on executive functions in elementary school children. *Journal of Applied School Psychology, 26*, 70-95. doi: 10.1080/15377900903379125.
- Freedenberg, V. A., Thomas, S. A., & Friedmann, E. (2015). A pilot study of a mindfulness based stress reduction program in adolescents with implantable cardioverter defibrillators or pacemakers. *Pediatric Cardiology, 36*, 786-795. doi: 10.1007/s00246-014-1081-5.
- Fuchs, W. W. (July, 2014). *Stress reduction training in adolescents*. Paper presented at the Division of International Special Education and Services Annual Conference, Braga, Portugal.
- Global Organization for Stress. (2016). Stress definitions. Retrieved from: <http://www.gostress.com/stress-definitions/>
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health

- benefits: A meta-analysis. *Journal of Psychosomatic Research*, 57, 35-43.
- Haydicky, J., Wiener, J., Badali, P., Milligan, K., & Ducharme, J. M. (2012). Evaluation of a mindfulness-based intervention for adolescents with learning disabilities and co-occurring ADHD and anxiety. *Mindfulness*, 3(2), 151-164.
- Helms, B. J. (1996, April). *School-related stress: Children with and without disabilities*. Paper presented at the annual conference of the American Educational Research Association, New York, US. Retrieved from <http://files.eric.ed.gov/fulltext/ED395409.pdf>
- Hilt, L. M., & Pollak, S. D. (2012). Getting out of rumination: Comparison of three brief interventions in a sample of youth. *Journal of Abnormal Child Psychology*, 40(7), 1157-1165.
- Himelstein, S., Hastings, A., Shapiro, S., & Heery, M. (2012). Mindfulness training for self-regulation and stress with incarcerated youth: A pilot study. *Probation Journal*, 59(2), 151-165.
- Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, 78(2), 169-183. doi: 10.1037/a0018555.
- International Stress Management Association. (2016). Facts about stress. Retrieved from: <http://www.isma.org.uk/about-stress/facts-about-stress/>
- Jee, S. H., Couderc, J., Swanson, D., Gallegos, A., Hilliard, C., Blumkin, A., Cunningham, K., & Heinert, S. (2015). A pilot randomized trial teaching mindfulness-based stress reduction to traumatized youth in foster care. *Complementary Therapies in Clinical Practice*, 21, 201-209.
- Joyce, A., ETTY-Leal, J., Zazryn, T., & Hamilton, A. (2010). Exploring a mindfulness meditation program on the mental health of upper primary children: A pilot study. *Advances in School Mental Health Promotion*, 3(2), 17-25.
- Kabat-Zinn, J. A. (2013). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York, NY: Bantam.
- Kabat-Zinn, J. A. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York, NY: Hyperion.
- Kaneshiro, N. K. (2014). Stress in childhood. University of Maryland Medical Center Encyclopedia. Retrieved from: <https://umm.edu/Health/Medical/Ency/Articles/Stress-in-childhood>.
- Kerrigan, D., Johnson, K., Steward, M., Magyari, T., Hutton, N., Ellen, J. M., & Sibinga, E. M. S. (2011). Perceptions, experiences, and shifts in perspective occurring among urban youth participating in a mindfulness-based stress reduction program. *Complementary Therapies in Clinical Practice*, 17, 96-101.
- Lau, N., & Hue, M. (2011). Preliminary outcomes of a mindfulness-based programme for Hong Kong adolescents in schools: Well-being, stress and depressive symptoms. *International Journal of Children's Spirituality*, 16, 315-330. doi: 10.1080/1364436X.2011.639747.
- Lazarus, R. (1999) *Stress and emotion: A new synthesis*. New York: Springer Pub. Co.
- Liehr, P., & Diaz, N. (2010). A pilot study examining the effect of mindfulness on depression and anxiety for minority children. *Archives of Psychiatric Nursing*, 24(1), 69-71.
- Mammarella, I. C., Ghisi, M., Bomba, M., Botessi, G., Broggi, F., & Nacinovich, R. (2016). Anxiety and depression in children with nonverbal learning disabilities, reading disabilities, or typical development. *Journal of Learning Disabilities*, 49(2), 130-139. doi: 10.1177/0022219414529336.
- Mendelson, T., Greenberg, M. T., Dariotis, J. K., Gould, L. F., Rhoades, B. L., & Leaf, P. J. (2010). Feasibility and preliminary outcomes of a school-based mindfulness intervention for urban youth. *Journal of Abnormal Child Psychology*, 38(7), 985-994.
- Napoli, M., Krech, P. R., & Holley, L. C. (2005). Mindfulness training for elementary school students: The Attention Academy. *Journal of Applied School Psychology*, 21(1), 99-123.
- Schonert-Reichl, K. & Lawlor, M. S. (2010). The effects of a mindfulness-based education program on pre- and early adolescents' well-being and social and emotional competence. *Mindfulness*, 1, 137-151. doi: 10.1007/s12671-010-0011-8.
- Semple, R. J., Lee, J., Rosa, D., & Miller, L. F. (2010). A randomized trial of mindfulness-based cognitive therapy for children: Promoting mindful attention to enhance social-emotional resiliency in children. *Journal of Children & Family Studies*, 19, 218-229. doi: 10.1007/s10826-009-9301-y.
- Semple, R. J., Reid, E. F. G., & Miller, L. (2005). Treating anxiety with mindfulness: An open trial of mindfulness training for anxious children. *Journal of Cognitive Psychotherapy: An International Quarterly*, 19, 379-392.
- Sibinga, E. M. S., Kerrigan, D., Steward, M., Johnson, K., Magyari, T., & Ellen, J. M. (2011). Mindfulness-based stress reduction for urban youth. *The Journal of Alternative and Complementary Medicine*, 17(3), 213-218.
- Sibinga, E. M. S., Perry-Parrish, C., Chung, S., Johnson, S. B., Smith, M., & Ellen, J. M. (2013). School-based mindfulness instruction for urban male youth: a small

randomized controlled trial. *Preventive Medicine*, 57, 799-801.

adolescents with ADHD: A feasibility study. *Journal of Attention Disorders*, 11(6), 737-746.

Sibinga, E. M. S., Perry-Parrish, C., Thorpe, K., Mika, M., & Ellen, J. M. (2014). A small mixed-method RCT of mindfulness instruction for urban youth. *Explore*, 10(3), 180-186.

Sibinga, E. M. S., Steward, M., Magyari, T., Welsh, C. K., Hutton, N., & Ellen, J. M. (2008). Mindfulness-based stress reduction for HIV-infected youth. *Explore*, 4(1), 36-37.

Sibinga, E. M. S., Webb, L., Ghazarian, S. R., & Ellen, J. M. (2016). School-based mindfulness instruction: An RCT. *Pediatrics*, 137(1), 1-8.

Sotardi, V. A. (2013). *On everyday stress and coping strategies among elementary school children* (Unpublished doctoral dissertation). University of Arizona, Tuscon, Arizona.

Tan, L., & Martin, G. (2013). Taming the adolescent mind: Preliminary report of a mindfulness-based psychological intervention for adolescents with clinical heterogeneous mental health diagnoses. *Clinical Child Psychology and Psychiatry*, 18(2), 300-312.

Teasdale, J. D., Segal, Z. V., Williams, J. M., Ridgeway, V. A., Soulsby, J. M., & Lauw, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology*, 68(4), 615-623.

van de Weijer-Bergsma, E., Formsma, A. R., de Bruin, E. I., & Bögels, S. M. (2012). The effectiveness of mindfulness training on behavioral problems and attentional functioning in adolescents with ADHD. *Journal of Child and Family Studies*, 21(5), 775-787.

van de Weijer-Bergsma, E., Langenberg, G., Brandsma, R., Oort, F. J., & Bögels, S. M. (2014). The effectiveness of a school-based mindfulness training as a program to prevent stress in elementary school children. *Mindfulness*, 5, 238-248.

van der Oord, S., Bögels, S. M., & Peijnenburg, D. (2012). The effectiveness of mindfulness training for children with ADHD and mindful parenting for their parents. *Journal of Child and Family Studies*, 21(1), 139-147.

Waltman, S. H., Hetrick, H., & Tasker, T. E. (2012). Designing, implementing, and evaluating in a group therapy for underserved populations. *Residential Treatment for Children and Youth*, 29(4), 305-323.

Wolf, C., & Serpa, J. G. (2015). *A clinician's guide to teaching mindfulness*. Oakland, CA: New Harbinger

Zylovska, L., Ackerman, D. L., Yang, M. H., Futrell, J. L., Horton, N. L., Hale, T. S., Pataki, C., & Smalley, S. L. (2008). Mindfulness meditation training in adults and

## CORRESPONDENCE

Wendy W. Fuchs  
Department of Teaching and Learning,  
Southern Illinois University Edwardsville  
E-mail: wfuchs@siue.edu