Adverse Events in Mindfulness-Based Interventions for ADHD

John T. Mitchell, Ph.D., Alex Bates, MB BCh, and Lidia Zylowska, M.D.

Mindfulness-based interventions (MBIs) are part of a broader class of interventions referred to as "third generation" or "third wave" behavior therapies (Hayes, Follette, & Linehan, 2004; Hayes, Luoma, Bond, Masuda, & Lillis, 2006). MBIs are derived from a long-standing Eastern tradition of Vipassana meditation (Hayes et al., 2004), meaning "seeing things as they really are," and teach *mindfulness* via formal meditation practice and informal practices. The term mindfulness itself is translated from the Pali word "sati" and has also been translated as "attention," "awareness," "retention," and "discernment" (Davidson & Kaszniak, 2015). One widely used definition of mindfulness is that it involves adopting a nonjudgmental attention to one's experience(s) in the present moment (Kabat-Zinn, 1990).

MBIs have garnered increasing support as efficacious for a variety of mental health disorders (e.g., Kuyken et al., 2016), and in the past 10 years, researchers have extended these efforts to attention-deficit/hyperactivity disorder (ADHD). According to one recent meta-analysis (Cairncross & Miller, 2016), there is a medium effect size of MBIs on both inattentiveness and hyperactivity-impulsivity symptoms in ADHD patients. The MBI treatment literature for ADHD is relatively more developed among adult than child and adolescence samples (e.g., there are five separate trials in which an MBI was compared against a control group in adult samples and none in child or adolescent samples). However, diverse treatment effects and methodological limitations still need to be more fully addressed across children, adolescents, and adults with ADHD (e.g., Davis & Mitchell, 2018; Mitchell, Zylowska, & Kollins, 2015; Mukerji Househam & Solanto, 2016). In particular, efforts to understand the positive therapeutic effects of MBIs for ADHD need to be balanced with an understanding of adverse events. As highlighted in this and the previous issue of *The ADHD Report*, adverse effects of psychosocial interventions are not fully explored in many treatment studies (Berk & Parker, 2009), and this is certainly true in the MBI for ADHD literature. The aim of this article is (a) to initiate a discussion of adverse events that may be applicable to MBI for ADHD treatment studies and (b) to call for incorporation of adverse event monitoring future MBI trials with ADHD samples.

ADVERSE EVENTS FROM MBI TREATMENT STUDIES IN ADHD SAMPLES

Adverse events in treatment outcome research are typically considered in the context of pharmacological interventions. Here we define adverse events as harmful effects resulting from any intervention, including psychotherapy (Linden, 2013). Often neglected in psychotherapy research, considering adverse events alongside positive effects of treatment (i.e., the costs and benefits analysis of treatment) provides a more accurate assessment of the impact of therapy on patients (Berk & Parker, 2009). Further, understanding adverse effects and the characteristics of the patients who experience them can further inform refinement of interventions.

In the MBI for ADHD literature, there have been over 10 trials across the lifespan, but few studies have examined adverse events. Only three peer-reviewed trials (Bueno et al., 2015; Zhang et al., 2017; Zylowska et al., 2008) commented on adverse events and consistently indicated that participants did not experience any. The adverse event assessments adopted in these treatment studies relied on patient-initiated comments. While these studies did attempt to address any negative effects of the interventions examined, this method of assessment may provide an underestimate of adverse events, which may prematurely result in practitioners and patients erroneously concluding that there are no adverse events associated with MBIs for ADHD.

Notably, one recent study (Janssen, de Vries, Hepark, & Speckens, 2017) used mixed quantitative-qualitative methodology to assess feasibility and impact of an adapted mindfulness-based cognitive therapy (MBCT) program for adult ADHD patients. Qualitative interviews explored the barriers and facilitators of the training, as well as the process of change. While adverse effects were not formally ascertained, the authors reported that no patients exhibited an increase in ADHD symptoms from pre- to post-treatment. Reporting on this aspect of negative treatment effects in MBIs for ADHD—worsening of psychiatric symptoms—is consistent with recommendations from the National Center for Complementary and Integrative Health of the National Institutes of Health (National Center for Complementary and Integrative Health, 2016). This potential adverse event may be particularly applicable to ADHD in MBI treatment studies. For instance, patients with ADHD are often inaccurate reporters of their own symptoms up through early adulthood (Barkley, Murphy, & Fischer, 2008). In MBIs, patients are taught to be more objective observers of their own behavior. Although this is taught in the context of letting go of judgments, this increased awareness could potentially result in an increase

© 2018 The Guilford Press

in self-reported symptoms and/or distress associated with these symptoms. For example, as patients become more objective observers of their own behavior and associated functional impairments, this may play into perceptions of being broken or flawed. Already such perceptions are common among ADHD samples, particularly adults (Mitchell, Benson, Knouse, Kimbrel, & Anastopolous, 2013), and an increased awareness of ADHD–related deficits could further deepen the perception of brokenness.

Interestingly, while Janssen and colleagues (2017) reported that increases in patient insight into their own behavioral ADHD patterns were reported by some as a positive development leading to increased sense of self-efficacy, a few other patients reported that the gained insight into the impact of ADHD resulted in a sense of helplessness. Additional symptoms, like depression, anxiety, and physical symptoms (e.g., pain) during the training, were also noted. Other reported barriers included feeling overwhelmed with amount of required homework; not feeling accepted by the therapist; and being bothered by others' lateness, excessive talking, or complaining during the sessions. Some patients reported difficulties dealing with inner restlessness, loss of focus, or noise during meditation. The latter difficulties are common—potentially more common for those with ADHD—experiences in meditation; however, if not properly addressed by the therapist, these experiences could increase adverse experiences for the participants, instill a sense of failure, and lead to dropout.

A greater understanding of dropout rates in MBI trials for ADHD may also inform knowledge about adverse events (i.e., those who drop out may do so as a result of an unreported adverse event). We reviewed the reported reasons in MBI for ADHD treatment studies for children, adolescents, and adults. Reasons ranged from universal barriers, such as a family emergency or illness (Zylowska et al., 2008), to experiences of "too much restlessness" and "exacerbation of depression" (Hepark et al., 2015). "Unmet expectations" was a reason for dropping out in an adult treatment study (Janssen et al., 2017), and one adolescent dropped out for "too severe externalizing and behavioral problems to participate in a group setting in another study" (van der Oord, Bogels, & Peijnenburg, 2012). In Janssen and colleagues (2017), overall noncompleters were significantly older and reported higher levels of executive and general dysfunction, as well as poorer physical and mental health status. Scheduling conflicts were frequently reported (Haydicky, Schecter, Wiener, & Ducharme, 2015; van der Oord, Bogels, & Peijnenburg, 2012), and while this is a universal barrier in any group therapy, it is possible that given the organizational and time-management challenges of ADHD, this is a particularly relevant barrier in MBIs (typically delivered in a group) that should be proactively tracked.

Given the paucity of a systematic, structured approach to measuring adverse events in the ADHD–mindfulness treatment literature, we now turn to the broader meditation literature. We intentionally cast a wide net of potential adverse events so they can be considered for the treatment of ADHD.

ADVERSE EVENTS IN MBIs AND MEDITATION: WHAT COULD BE MEASURED IN MBI TRIALS FOR ADHD?

Over 20 published case reports or observational studies have documented meditation-related events that warranted additional treatment, including psychosis, mania, depersonalization, anxiety, panic, and re-experiencing traumatic events in different clinical samples (Van Dam et al., 2017). Indeed, some of these adverse events are identified by organizations like the American Psychiatric Association. For example, for dissociative disorders, the Diagnostic and Statistical Manual (American Psychiatric Association, 1994; 2013) provides a description of meditation-induced depersonalization/derealization as a non-diagnostic culture-related issue. In a recent meta-analysis of trials examining MBCT for recurrent depression, Kuyken and colleagues (Kuyken et al., 2016) reported that five of nine treatment studies measured either serious adverse events or reactions. These assessments included active monitoring through questionnaires or clinician interviews. Three of these trials did not report any adverse events for those randomized to MBCT. The remaining trials reported serious adverse events at an equivalent or lower frequency than active treatment comparison groups. As reported in Van Dam and colleagues (2017), guidelines for identifying MBI adverse events are emerging that can guide more active adverse event monitoring in future treatment studies. For example, increases in suicidality, depression, and negative emotions, as well as use of MBIs for trauma survivors due to concerns about re-experiencing traumatic events, have been reported and should be monitored (Kuyken, Crane, & Williams, 2012).

One recent mixed-methods approach examined meditation-related experiences considered to be challenging, difficult, distressing, or functionally impairing (Lindahl, Fisher, Cooper, Rosen, & Britton, 2017). This study involved over 80 practitioners and experts on meditation from a variety of different traditions. Qualitative interviews identified 59 meditation-related experiences across seven different domains (i.e., cognitive, perceptual, affective, somatic, conative, sense of self, and social). Among the experiences identified (not already reviewed above) were anger, anhedonia, dizziness, headaches or head pressure, and loss of sense of agency. Some of these identified experiences may be particularly applicable to ADHD, such as anhedonia, given that individuals with ADHD can be low in motivation (Volkow et al., 2011) and anger given that individuals with ADHD can exhibit problems with emotion regulation (Barkley, 2010). Some of the reported effects in Lindahl and colleagues (2017), such as worsening of executive functioning, contrast with studies examining the same construct in ADHD and non–ADHD samples (e.g., see Mitchell et al., 2015, for a re-

© 2018 The Guilford Press

view), though they deserve continued empirical scrutiny—particularly given the methodological differences between qualitative and quantitative measurement of executive functioning. Lindahl and colleagues (2017) also demonstrated that the interpretations and reactions to these events by practitioners varied widely, ranging from being positive to negative experiences at different time points. Therefore, the application to ADHD should consider not just experiences at an isolated time point, but rather over the course of and following treatment. The identified 59 categories in the above study will be converted into a measure that will be available for future clinical trials of MBIs for systematic assessment across studies (Van Dam et al., 2017). Inclusion of this measure or others like it would be beneficial in future MBI trials in ADHD patients.

Broader efforts to identify other forms of harm that could result from MBIs should also guide investigations of adverse events in ADHD samples. The directors of the National Center for Complementary and Integrative Health of the National Institutes of Health have stated that a potential harm of complementary interventions, including MBIs, is that vulnerable patients may be misled by inaccurate claims about both beneficial and harmful effects (Briggs & Killen, 2013). Thus, exclusive referral to MBI treatment could divert ADHD patients and families from pursuing other treatment options, such as medications that are more beneficial (Van Dam et al., 2017).

Relevant to adverse reaction monitoring is how such reactions are framed in the context of the overall intervention. In the religious meditation traditions that MBIs are derived from, positive and negative experiences in different meditation practices are not simply experiences that are to be embraced and avoided, respectively. Rather, some negative experiences may be interpreted as signs of progress in one's meditation practice. Conversely, pleasant meditation experiences may lead to misguided behavior (reviewed in Lindahl et al., 2017). Although at first pass this may seem counterintuitive (i.e., negative experiences from distress elicited from meditation may be a sign of progress and pleasant experiences evoked by meditation may have negative consequences), this is in line with how we conceptualize some psychotherapies. For example, exposure therapy is an intervention that necessitates a form of controlled exposure to emotionally provocative stimuli that elicit negative emotional states (e.g., anxiety) in the short term to reduce this emotional response in the long term. Therefore, any research that examines adverse effects of treatment should consider not just the cost-benefit ratio, but whether an adverse effect is linked to where a patient is in the process of treatment. Essentially, clinicians and researchers should ask themselves if an adverse event is not just acceptable, but necessary in the process of behavior change.

CONCLUSION

The ADHD–MBI treatment literature is a burgeoning field with promising findings. As this literature continues to grow, researchers should consider not just the beneficial effects of MBIs for ADHD, but the negative effects as well. This will require routine, active monitoring of adverse events, which has yet to be carried out in MBI studies targeting individuals with ADHD. While there are concerns that specific prompts about adverse events may introduce biased responses (Faraone & Glatt, 2010), active probing of adverse events is needed to identify events patients may not otherwise report and may consequently result in the erroneous conclusion that an adverse event not reported is evidence that adverse events do not occur. To balance this out, researchers may want to consider both traditional quantitative approaches to measuring adverse events (e.g., self-report checklists) with more open-ended qualitative approaches. Such mixed-method approaches may aid attempts to understand the complex phenomenology of adverse events in MBIs for children, adolescents, and adults diagnosed with ADHD.

John T. Mitchell is an assistant professor with the Duke ADHD Program, Department of Psychiatry, Duke University Medical Center in Durham, North Carolina; e-mail: john.mitchell@duke.edu. Alex Bates is a student in the Department of Psychiatry, University of Minnesota Medical School, Minneapolis. Lidia Zylowska is an associate professor in the Department of Psychiatry at the University of Minnesota Medical School, Minneapolis.

REFERENCES

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders: DSM-IV*. Washington, DC: American Psychiatric Association.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders, 5th edition (DSM-5)*. Washington, DC: American Psychiatric Association.

Barkley, R. A. (2010). Deficient emotional self-regulation is a core component of attention-deficit/hyperactivity disorder. *Journal of ADHD & Related Disorders, 1*(2), 5-37.

Barkley, R. A., Murphy, K. R., & Fischer, M. (2008). *ADHD in adults: What the science says*. New York, NY: Guilford.

Berk, M., & Parker, G. (2009). The elephant on the couch: Side-effects of psychotherapy. *Australian and New Zealand Journal of Psychiatry, 43*(9), 787-794. doi:10.1080/00048670903107559

Briggs, J. P., & Killen, J. (2013). Perspectives on complementary and alternative medicine research. *Journal of the American Medical Association, 310*(7), 691-692. doi:10.1001/jama.2013.6540

Bueno, V. F., Kozasa, E. H., da Silva, M. A., Alves, T. M., Louza, M. R., & Pompeia, S. (2015). Mindfulness meditation improves mood, quality of life, and attention in adults with attention deficit hyperactivity disorder. *Biomed Research International, 2015*, 962857. doi:10.1155/2015/962857

Cairncross, M., & Miller, C. J. (2016). The effectiveness of mindfulness-based therapies for ADHD: A meta-analytic review. *Journal of Attention Disorders*. doi:10.1177/1087054715625301

Davidson, R. J., & Kaszniak, A. W. (2015). Conceptual and methodological issues in research on mindfulness and meditation. *American Psychologist, 70*(7), 581-592. doi:10.1037/a0039512

Davis, N. O., & Mitchell, J. T. (2018). Mindfulness for adolescents with ADHD. In

© 2018 The Guilford Press

S. P. Becker (Ed.), *ADHD in adolescents*. New York, NY: Guilford.

Faraone, S. V., & Glatt, S. J. (2010). Effects of extended-release guanfacine on ADHD symptoms and sedation-related adverse events in children with ADHD. *Journal of Attention Disorders, 13*(5), 532-538. doi:10.1177/1087054709332472

Haydicky, J., Schecter, C., Wiener, C., & Ducharme, J. M. (2015). Evaluation of MBCT for adolescents with ADHD and their parents: Impact on individual and family functioning. *Journal of Child and Family Studies, 24*, 76-94. doi:10.1007/s10826-013-9815-1

Hayes, S. C., Follette, V. M., & Linehan, M. M. (Eds.). (2004). *Mindfulness and acceptance: Expanding the cognitive-behavioral tradition*. New York, NY: Guilford.

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Reseach and Therapy, 44*(1), 1-25. doi:10.1016/j.brat.2005.06.006

Hepark, S., Janssen, L., de Vries, A., Schoenberg, P. L., Donders, R., Kan, C. C., & Speckens, A. E. (2015). The efficacy of adapted MBCT on core symptoms and executive functioning in adults with ADHD: A preliminary randomized controlled trial. *Journal of Attention Disorders*. doi:10.1177/1087054715613587

Janssen, L., de Vries, A. M., Hepark, S., & Speckens, A. E. M. (2017). The feasibility, effectiveness, and process of change of mindfulness-based cognitive therapy for adults with ADHD: A mixed-method pilot study. *Journal of Attention Disorders*, 1087054717727350. doi:10.1177/1087054717727350

Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York, NY: Deltacorte.

Kuyken, W., Crane, W., & Williams, J. M. (2012). *Mindfulness-based cognitive therapy (MBCT) implementation resources*. Oxford, UK: Mindfulness Centres, Oxford, Exeter, and Bangor Universities.

Kuyken, W., Warren, F. C., Taylor, R. S., Whalley, B., Crane, C., Bondolfi, G., . . . Dalgleish, T. (2016). Efficacy of mindfulness-based cognitive therapy in prevention of depressive relapse: An individual patient data meta-analysis from randomized trials. *JAMA Psychiatry, 73*(6), 565-574. doi:10.1001/jamapsychiatry.2016.0076

Lindahl, J. R., Fisher, N. E., Cooper, D. J., Rosen, R. K., & Britton, W. B. (2017). The varieties of contemplative experience: A mixed-methods study of meditation-related challenges in Western Buddhists. *PLoS One, 12*(5), e0176239. doi:10.1371/journal.pone.0176239

Linden, M. (2013). How to define, find and classify side effects in psychotherapy: From unwanted events to adverse treatment reactions. *Clinical Psychology and Psychotherapy, 20*(4), 286-296. doi:10.1002/cpp.1765

Mitchell, J. T., Benson, J. W., Knouse, L. K., Kimbrel, N. A., & Anastopolous, A. D. (2013). Are negative automatic thoughts associated with ADHD in adulthood? *Cognitive Therapy and Research, 37*(4), 851-859. doi:10.1007/s10608-013-9525-4

Mitchell, J. T., Zylowska, L., & Kollins, S. H. (2015). Mindfulness meditation training for attention-deficit/hyperactivity disorder in adulthood: Current empirical support, treatment overview, and future directions. *Cognitive and Behavioral Practice, 22*(2), 172-191. doi:10.1016/j.cbpra.2014.10.002

Mukerji Household, A., & Solanto, M. V. (2016). Mindfulness as an intervention for ADHD. *The ADHD Report, 24*(2), 1-13.

National Center for Complementary and Integrative Health. (2016). *What the science says about safety and side effects of meditation*. Retrieved from https://nccih.nih.gov/health/meditation/overview.htm#hed5

Van Dam, N. T., van Vugt, M. K., Vago, D. R., Schmalzl, L., Saron, C. D., Olendzki, A., . . . Meyer, D. E. (2017). Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness and meditation. *Perspectives on Psychological Science*, 1745691617709589. doi:10.1177/1745691617709589

van der Oord, S., Bogels, 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. doi:10.1007/s10826-011-9457-0

Volkow, N. D., Wang, G. J., Newcorn, J. H., Kollins, S. H., Wigal, T. L., Telang, F., . . . Swanson, J. M. (2011). Motivation deficit in ADHD is associated with dysfunction of the dopamine reward pathway. *Molecular Psychiatry, 16*(11), 1147-1154. doi:10.1038/mp.2010.97

Zhang, D., Chan, S. K. C., Lo, H. H. M., Chang, C. Y. H., Chan, J. C. Y., Ting, K. T., . . . Wong, S. Y. S. (2017). Mindfulness-based intervention for Chinese children with ADHD and their parents: A pilot mixed-method study. *Mindfulness, 8*(4), 859-872. doi:10.1007/s12671-016-0660-3

Zylowska, L., Ackerman, D. L., Yang, M. H., Futrell, J. L., Horton, N. L., Hale, T. S., . . . Smalley, S. L. (2008). Mindfulness meditation training in adults and adolescents with ADHD: A feasibility study. *Journal of Attention Disorders, 11*(6), 737-746. doi:10.1177/1087054707308502

© 2018 The Guilford Press

The ADHD Report
Guilford Publications, Inc.
370 Seventh Avenue
Suite 1200
New York, NY 10001-1020

Address Service Requested

PRESORT STD
US POSTAGE
PAID
Burlington, VT
Permit #165