



Mindfulness-based interventions with youth: A comprehensive meta-analysis of group-design studies

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ABSTRACT

The treatment effects of Mindfulness-Based Interventions (MBIs) with youth were synthesized from 76 studies involving 6121 participants. A total of 885 effect sizes were aggregated using meta-regression with robust variance estimation. Overall, MBIs were associated with small treatment effects in studies using pre-post ($g = 0.305$, $SE = 0.039$) and controlled designs ($g = 0.322$, $SE = 0.040$). Treatment effects were measured after a follow-up period in 24 studies ($n = 1963$). Results demonstrated that treatment effects were larger at follow-up than post-treatment in pre-post ($g = 0.462$, $SE = 0.118$) and controlled designs ($g = 0.402$, $SE = 0.081$). Moderator analyses indicated that intervention setting and intervention dosage were not meaningfully related to outcomes after controlling for study design quality. With that said, the between-study heterogeneity in the intercept-only models was consistently small, thus limiting the amount of variance for the moderators to explain. A series of exploratory analyses were used to investigate the differential effectiveness of MBIs across four therapeutic process domains and seven therapeutic outcome domains. Small, positive results were generally observed across the process and outcome domains. Notably, MBIs were associated with moderate effects on the process variable of mindfulness in controlled studies ($n = 1108$, $g = 0.510$). Limitations and directions for future research and practice are discussed.

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1. Introduction

Within the realm of scientific psychology, Bishop et al. (2004, p. 232) defined mindfulness as a two-component construct consisting of “the self-regulation of attention so that it is maintained on immediate experience,” which is accompanied by “a particular orientation toward one’s experiences in the present moment, an orientation that is characterized by curiosity, openness, and acceptance.” In order to adopt this definition for use within applied psychology, there are two key assumptions necessary. The first is that these components of mindfulness represent skills that can be learned like any other skill. The second is that learning mindfulness skills can have therapeutic effects on life outcomes. These two assumptions are what originally motivated the application and investigation of mindfulness-based interventions (MBIs) in clinical settings over 40 years ago (see Baer, 2003,

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for a brief history). For the purposes of this study, we defined MBIs as any treatment that intentionally trains mindfulness skills (i.e., self-regulation of attention on immediate experience paired with an accepting attitude toward one's experience) as the core therapeutic component for reducing problem behavior or increasing wellbeing behavior.

MBIs include a growing number of programs and practices with important differences in their underlying theories, content, dosage, and evidence of effectiveness (Greenberg & Harris, 2012; Harnett & Dawe, 2012). Perspectives have also varied regarding the potential theoretical mechanisms of MBIs that drive change in treatment outcomes. Shapiro et al. (2006) posited that the intentionality, attention, and attitude cultivated by mindfulness training lead to a shift in perspective (i.e., from subjective to objective) regarding one's internal and external experience. This shift in perspective influences additional psychological processes that may mediate the association between mindfulness and desired treatment outcomes. Researchers have identified several other potential mechanisms of mindfulness, including attention regulation, emotional regulation, behavioral flexibility, decreased rumination, and exposure (Bishop et al., 2004; Fletcher & Hayes, 2005; Hill & Updegraf, 2012; Grabovac et al., 2011; Roemer, Williston, & Rollins, 2015). Although many of these mechanisms appeal to similar psychological constructs, there are substantive philosophical and practical differences in how these constructs are operationalized by respective theorists, resulting in a lack of scholarly consensus regarding how MBIs actually achieve therapeutic effects (see Hayes & Shenk, 2004, for more on this point).

1.1. Mindfulness-based interventions

As mentioned above, MBIs can be understood as a class of psychological interventions that aim to train clients in mindfulness skills for the purposes of achieving a variety of therapeutic effects. MBI research originated with adults in medical settings during the late 1970s and 1980s. The first MBI was developed as a group-based treatment, known as mindfulness-based stress reduction (MBSR), which proved useful for helping patients cope more successfully with chronic illness and pain (Grossman, Nieman, Schmidt, & Walach, 2004). Throughout the 1990s, the use of MBSR was generalized to community and other clinical settings for the purposes of treating a variety of psychological disorders. Additional formalized intervention approaches were created, such as mindfulness-based cognitive therapy (MBCT), which proved useful as both group-based and individualized interventions for depression and anxiety (Baer, 2003). Given their success with adults in clinical settings, MBIs were generalized to youth in clinical settings and to students in school settings, beginning in the early 2000s (Burke, 2010). The transition to school settings provided opportunities to use MBIs for population-based prevention purposes, targeting typical samples of youth (as opposed to clinical samples), and exploring the potential effects of mindfulness training on non-pathological indicators of wellbeing (e.g., cognitive skills and positive emotion) as a complement to traditional indicators of problem behavior (Felver, Celis-de Hoyos, Tezanos, & Singh, 2016).

Taken together, findings from the past 40 years of research suggest that MBIs are effective for adults with clinical concerns (e.g., Grossman et al., 2004; Khoury et al., 2013). For example, a recent comprehensive meta-analysis conducted by Khoury et al. (2013), which considered studies published through May 2013 ($K = 209$, $N = 12,145$), indicated that MBIs yielded moderate effect sizes across various pre-post studies ($k = 72$, $g = 0.55$), waitlist controlled studies ($k = 67$, $g = 0.53$), and treatment controlled studies ($k = 68$, $g = 0.33$). Khoury and colleagues also showed that MBIs produced larger effect sizes when targeting psychological disorders compared to medical conditions (e.g., waitlist controlled: psychological disorders $k = 18$, $g = 0.70$; medical conditions $k = 28$, $g = 0.40$). Furthermore, follow-up evaluations indicated MBIs generally maintain positive therapeutic effects post-treatment (pre-post $k = 24$, $g = 0.57$; waitlist controlled studies $k = 17$, $g = 0.43$; treatment controlled $k = 30$, $g = 0.24$).

The same level of clarity regarding the effectiveness of MBIs with youth has yet to be obtained, likely because MBI research with children and adolescents was initiated approximately 25 years after research with adults, resulting in far fewer intervention studies to date. That said, a growing number of systematic reviews and meta-analyses of MBIs with youth have been published, with findings suggesting that MBIs are feasible and effective for reducing problem behaviors and improving wellbeing in youth. In the following sections we briefly review the conclusions from prior systematic reviews of MBIs for youth and then review the results from three meta-analytic reviews in substantial depth. Throughout this discussion, we use Cohen's (1988) criteria to describe the reported effect sizes.

1.2. Systematic reviews of MBIs with youth

Black, Milam, and Sussman (2009) conducted the first systematic review of MBIs with youth, identifying 10 studies published through December 2008 that investigated MBSR, MBCT, or other non-programmatic mindfulness exercises. Black et al. (2009) reported that two MBI studies targeting physiological outcomes yielded small effect sizes ($d = 0.22$ and 0.26), while the eight studies targeting psychosocial and behavioral outcomes produced a range of small to moderate effects (d range = 0.27 – 0.70), with no iatrogenic effects observed.

Burke (2010) identified 15 MBI studies with no search delimiter date, including nine group-design, three single-case design, and three case studies. Of these studies, nine examined clinical samples and six targeted non-clinical samples. Burke (2010) reported a range of negative ($d = -0.10$) to large effect sizes ($d = 1.5$) overall. As only one study found a negative effect (on parent-rated social behavior), Burke concluded that MBIs were useful for improving most targeted physical and mental health related outcomes, that positive effects were observed for youth in preschool through high school, and that MBIs were perceived by youth and caregivers as being generally acceptable interventions.

Harnett and Dawe (2012) built upon Burke's (2010) review by identifying 24 additional studies published through 2009, including a few studies that targeted caregivers for the purposes of indirectly improving youths' outcomes. Harnett and Dawe

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