

Mindfulness-Based Interventions among Adolescents with Chronic Diseases in Clinical Settings: A Systematic Review

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ABSTRACT

Introduction: We aimed to determine the benefits/efficacy of mindfulness-based interventions (MBIs) implemented among adolescents with chronic diseases in clinical settings.

Methods: An electronic search of PubMed, CINAHL, and PsycINFO databases was conducted in November 2017 to

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Conflicts of interest: None to report.

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0891-5245/\$36.00

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<https://doi.org/10.1016/j.pedhc.2018.04.001>

identify studies in which mindfulness was the primary intervention delivered for adolescents with chronic diseases to improve psychological and physical health.

Results: Nineteen eligible studies were included in this review. Fifteen studies included adolescents with psychiatric or pain disorders, and four included adolescents with a chronic physical disorders. Psychological outcomes and pain were examined in most studies with effect sizes for MBIs ranging from small to large.

Discussion: MBI studies conducted in clinical settings mainly engaged adolescents with psychiatric or pain disorders. The effectiveness of MBIs on improving psychological outcomes were inconsistent. Large randomized trials are needed to examine the effectiveness of MBIs and should expand to include adolescents with chronic physical diseases. *J Pediatr Health Care.* (2018) ■■, ■■-■■■.

KEY WORDS

Adolescents, chronic diseases, mindfulness, systematic review

Mindfulness, as defined by Kabat-Zinn (2003, p. 145), is “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003). The two core concepts of mindfulness across different definitions are attention and awareness of one’s present moment experience and adopting an attitude of acceptance toward one’s experience whether the experience is negative,

positive, or neutral (Creswell, 2017). The origin of mindfulness practices goes back to the Buddhist traditions (Kabat-Zinn, 1990). However, mindfulness meditation practices are applied in a secular context, offering universal applications to individuals of different religions and cultural backgrounds in Western society.

Mindfulness has been applied in varying ways by different research teams. Mindfulness-based stress reduction (MBSR) was developed in the 1970s by Dr. Jon Kabat-Zinn and his team at the Stress Reduction Clinic and Center for Mindfulness in Medicine, Health Care, and Society at the University of Massachusetts for relieving stress and managing chronic pain (Kabat-Zinn, 1990). MBSR is an evidence-based 8-week program that aims to reduce stress and improve coping skills through training in formal mindfulness practices (e.g., body scan, sitting, and movement meditations) and informal mindfulness practices that can be integrated in daily life activities (e.g., mindful walking, mindful eating) to bring in the mindfulness core concepts of intention, attention, and attitude (Kabat-Zinn, 1990). Later, mindfulness-based cognitive therapy (MBCT) was adapted from MBSR to prevent relapse of major depression among adults (Segal, Williams, & Teasdale, 2002). Both MBSR and MBCT were later adapted to improve psychological and physiologic outcomes among patients with other chronic disorders and healthy individuals (Arias, Steinberg, Banga, & Trestman, 2006; Creswell, 2017; Grossman, Niemann, Schmidt, & Walach, 2004; Reiner, Tibi, & Lipsitz, 2013; Speca, Carlson, Goodey, & Angen, 2000; Williams, Kolar, Reger, & Pearson, 2001). More recently, both MBSR and MBCT programs have been adapted to pediatric populations and were tailored to meet children's and adolescents' developmental needs (Biegel, Brown, Shapiro, & Schubert, 2009; Sibinga et al., 2013; Sibinga, Webb, Ghazarian, & Ellen, 2016). Adapted MBSR and MBCT were used in many studies, and they included modifications such as shortening the duration, increasing the frequency of the sessions, and using age-appropriate vocabulary. Finally, there were mindfulness-related interventions that incorporated mindfulness into broader multicomponent treatment programs such as acceptance and commitment therapy and dialectical behavior therapy.

Psychological and neurobiological theories have been applied to explain the positive effect of mindfulness-based interventions (MBIs) on the outcome of interest. The primary psychological mechanism indicates that mindfulness cultivated by mindfulness training mediates the change in health outcomes (Bluth & Eisenlohr-Moul, 2017; Creswell, 2017; Galla, 2016). Another psychological mechanism indicates that cultivating self-compassion is the mediator of change in health outcomes (Bluth & Eisenlohr-Moul, 2017; Carmody, Baer, Lykins, & Olendzki, 2009; Galla, 2016; Keng, Smoski, Robins, Ekblad, & Brantley, 2012; Neff

& Germer, 2013); *self-compassion* is defined as an open-hearted awareness of and sympathy toward one's own suffering or personal failures (Neff, 2003). A neurobiological theory of the stress-buffering effects of mindfulness posits that mindfulness increases the recruitment of the stress-regulatory pathway, including prefrontal regulatory regions that may inhibit activity in stress-processing regions such as the amygdala (i.e., top-down regulatory pathway), and reduces the reactivity of central stress-processing pathway that signals peripheral stress response cascades (i.e., bottom-up stress pathway; Creswell & Lindsay, 2014). Mindfulness mitigates stress appraisals and reduces stress-reactivity responses. Thus, the effects of mindfulness on reducing stress explain how mindfulness affects health outcomes. In addition, this means that mindfulness-based health effects are mostly likely to be observed in high-stress populations such as those with psychological stress or chronic diseases that can be aggravated by stress (Creswell & Lindsay, 2014).

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Systematic reviews of the growing research regarding MBIs in children and adolescents have shown that MBIs are effective in improving psychological and physiologic health among healthy and chronically ill adolescents (Black, Milam, & Sussman, 2009; Burke, 2009; Greenberg & Harris, 2012; Townshend, Jordan, Stephenson, & Tsey, 2016; Zenner, Herrnleben-Kurz, & Walach, 2014; Zoogman, Goldberg, Hoyt, & Miller, 2015). A meta-analysis of 20 studies through 2011 on MBIs among youth (age < 18 years) found that MBIs were effective in improving psychological symptoms including depression and anxiety (the primary omnibus effect size; $d = 0.37$), general functioning (i.e., quality of life), and mindfulness measures ($d = 0.28$; Zoogman et al., 2015). Although this meta-analysis found that MBIs were associated with greater improvement in clinical settings ($d = 0.5$) compared with nonclinical settings ($d = 0.2$, $p = .024$; Zoogman et al., 2015), most studies engaged healthy youth who were recruited from school settings (16 school-based vs. 4 clinical). Moreover, a recent review focused on children and adolescents in a clinical setting; however, this review included only adolescents with chronic physical illness, encompassed several case studies and one-group pre-post intervention design studies, and was not able to detect the power of MBIs (Ahola Kohut, Stinson, Davies-Chalmers, Ruskin, & van Wyk, 2017).

Although reviews have looked into various outcomes to examine the effectiveness of MBIs, only one review examined the effects of MBIs in improving physiologic outcomes such as decreasing heart rate (HR)

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