



Mindfulness-Based Interventions for Improving Academic Achievement, Behavior and Socio-Emotional Functioning of Primary and Secondary Students: A Systematic Review

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TITLE OF THE REVIEW

Mindfulness-Based Interventions for Improving Academic Achievement, Behavior and Socio-Emotional Functioning of Primary and Secondary Students: A Systematic Review

BACKGROUND

Mindfulness is a popular topic in the public realm and being promoted by high profile stars and athletes as a means of improving health and well-being. While mindfulness seems to be a popular trend being adopted by individuals, it is also beginning to be considered in various areas of public policy, including education policy. There is growing interest in the use of mindfulness practices in education to enhance and supplement instruction. Mindfulness practices have been hypothesized to positively affect cognitive and academic performance and skills related to the learning process (e.g., attention, self-regulation, management of stress) as well as enhance social skills and as a vehicle for a more holistic approach to developing the “whole person”. Schools across the U.S. and U.K. are implementing various mindfulness-based programs and integrating mindfulness into the curricula, and various efforts are being made to promote mindfulness practices in school and in public policy. In the U.K., for example, members of parliament have received training in mindfulness and have heard testimony of the evidence and benefits of mindfulness, including testimony from some of the thousands of school children who have experienced mindfulness training in school. Also this year, an all-party parliamentary group was launched in the U.K. to conduct a nine month inquiry into the potential role of mindfulness in areas of public policy, including education (Booth, 2014). The third session of the all-party parliamentary group focused on “mindfulness in health and education”, and members considered possible applications of mindfulness in health and education, with discussion of challenges for scaling up mindfulness programmes and suggestions that mindfulness be included in teacher training as well as other potential policy actions (<http://parliamentarywellbeinggroup.org.uk>).

While there is a significant and growing body of evidence supporting mindfulness practices in various areas with adults, less is known about the effects of mindfulness with children and youth, particularly for use by schools and education systems. Systematic synthesis of mindfulness-based programs and curricula in the area of education, particularly the largely untapped grey literature, is certainly needed to provide a comprehensive picture of the evidence as schools and policy makers contemplate the integration of mindfulness into schools and education policy.

Mindfulness, originating from the Buddhist tradition but often taught without reference to its Buddhist roots, is defined variously as “paying attention in a particular way: on purpose, in the present moment, nonjudgmentally” (Kabat-Zinn, 1994, p. 4), or as the “self-regulation of attention to the conscious awareness of one’s immediate experiences while adopting an

attitude of curiosity, openness, and acceptance” (Bishop et al., 2004, p. 174). While definitions of mindfulness vary, Shapiro and colleagues (2006) proposed that mindfulness practice is comprised of three primary elements: attitudinal foundations (non-judgement, acceptance, trust, curiosity); focused, broad, and sustained attention; and intention (directing, sustaining, or switching attention).

Over the past decade, interest in mindfulness has been growing and mindfulness-based approaches to improving health and well-being have spread across fields, including psychology, healthcare, neuroscience, and business. This burgeoning interest in mindfulness is due, at least in part, to a significant and growing body of evidence pointing to positive effects of mindfulness training for a myriad of problems and outcomes. In the fields of medicine, psychology, and counseling for example, there is a growing body of research investigating the efficacy of mindfulness-based interventions (MBI) for medical and psychological conditions implemented in clinical settings by medical professionals. Numerous studies and meta-analyses have investigated the use of MBIs in medical situations, with mindfulness training and practice being found to help patients with chronic conditions manage pain (e.g., Cramer, Haller, Lauche, & Dobos, 2012; Veehof, Oskam, Schreurs, & Bohlmeijer, 2011) and fibromyalgia symptoms (i.e., Lauche, Holger, Dobos, Langhorst, & Schmidt, 2013), and reduce stress in breast cancer patients (i.e., Zainal, Booth, & Huppert, 2013). Additionally, syntheses and meta-analyses have found positive effects for mindfulness training in treating individuals with mental health diagnoses, such as anxiety (de Vibe et al., 2012; Vollestad, B. Nielsen, & H. Nielsen, 2012), psychiatric disorders (i.e., Chiesa & Serretti, 2011), and psychosis (Khoury, Lecomte, Gaudiano, & Paquin, 2013), as well as for personal development and quality of life (de Vibe et al., 2012) and stress in healthy people (i.e., Chiesa & Serretti, 2009), including university students (Regehr, Glancy, & Pitts, 2013).

Mindfulness-based interventions and research examining effects of such interventions have largely focused on adult populations and conducted within clinical settings; however, there has been growing interest in applying mindfulness-based approaches with children and youth in clinical and non-clinical settings. Mindfulness approaches have been applied to pain management in adolescents (Thompson & Gauntlett-Gilbert, 2008), treatment of ADHD (Singh et al., 2010; Zylowski et al., 2007), anxiety (Semple et al., 2005), sleep disorders (Bootzin & Stevens, 2005) and gastrointestinal reflux (Ott, 2002) among others. In short, a growing body of research on mindfulness approaches with children and youth suggests that mindfulness-based approaches are acceptable, feasible, and can be effective with children and youth (Semple et al., 2006).

Mindfulness-based approaches also appear to be on the rise in education as evidenced by a growing number of organizations supporting mindfulness-based approaches in schools and an increase in the number of mindfulness training programs and curricula developed for primary and secondary students (e.g., the Hawn Foundation, The Inner Resilience Program, South Burlington Wellness and Resilience Program, Mindful Schools, Learning to Breathe,

Mindfulness in Schools Project, Still Quiet Place, Stressed Teens, and Wellness Works in Schools). The burgeoning interest in mindfulness-based interventions in school settings has been fueled by shifts in the educational environment, such as increased emphasis on high stakes testing and awareness of students with high levels of test anxiety (Gregor, 2005; Von Der Embse, Barterian, & Segool, 2013), increases in the prevalence of behavioral and mental health problems in students, and evidence supporting relationships of emotion regulation and stress with academic, cognitive, and behavioral functioning in school. Moreover, there is emerging evidence that childhood adversity has been found to trigger neurobiological events that may alter brain development (Anderson, 2003; Shonkoff et al., 2009; Teicher et al., 2002) potentially impairing the stress response systems that underlie cognitive and emotional regulatory capacities (Anderson & Teicher, 2009). Children who experience chronic stress are potentially at-risk for difficulties with cognitive and emotion regulation, which can lead to maladaptive developmental trajectories (Compas et al., 2001). Emotional regulatory capabilities have been shown to mediate the relationship between exposure to stress and youth outcomes in multiple studies (Sandler et al., 2000; Wolchik et al., 2006). Mindfulness training is hypothesized to “enhance students’ capacities for self-regulation of attention and emotions, and buffer the developing brain from deleterious effects of excessive stress” (Meiklejohn, 2012), which could lead to improved behavior and academic achievement in school. As such, educators and schools have begun to adopt mindfulness-based interventions as part of educational programming.

While the use of mindfulness-based programs appears to be on the rise in schools and policy makers are calling for more mindfulness in education policy, it is unclear whether mindfulness-based approaches do indeed positively impact academic functioning and behavior in schools. The seemingly growing acceptance of mindfulness-based approaches for use in school settings appears to be largely driven by intervention studies with adult populations and by the theory of change model hypothesizing positive effects of mindfulness-based interventions rather than substantial evidence of effects on student outcomes. As schools develop practices and policies to try to more effectively and efficiently improve student outcomes, it is important that practitioners, policy makers and stakeholders have access to evidence of effects of mindfulness-based interventions and are aware of evidence gaps in order to make informed decisions rather than rely on anecdotal evidence and follow current popular trends. A rigorous systematic review or meta-analysis synthesizing effects of mindfulness-based interventions in schools, however, has not been conducted to our knowledge.

OBJECTIVES

The purpose of this review is to examine and synthesize evidence of mindfulness-based interventions implemented in school settings with primary and secondary students on achievement, behavior and socio-emotional outcomes to inform education practice and policy. Specifically, this review is designed to answer the following research questions:

1. What types mindfulness-based interventions are being evaluated in school settings?
2. What is the state and quality of evidence of intervention outcomes studies of mindfulness-based interventions in school settings?
3. What are the effects of mindfulness-based interventions on academic achievement, behavior and socio-emotional outcomes?

EXISTING REVIEWS

While several reviews have been conducted on mindfulness-based interventions with adults for a myriad of problems and outcomes, less attention has been given to reviewing the literature on outcomes of mindfulness-based approaches for children and youth, particularly related to outcomes relevant to mindfulness-based approaches in education. To date, we have located four reviews of mindfulness-based interventions that include studies with children or youth; however, only one of these specifically addresses mindfulness in education.

Mieklejohn and colleagues (2012) reviewed the literature related to integrating mindfulness training in primary and secondary education. This traditional, narrative literature review described mindfulness programs the authors identified through an unspecified method targeting teachers and students. This review identified and described 14 studies of mindfulness programs for elementary and high school students that reported outcomes of a range of outcomes including academic and social skills, emotional regulation, attention, and anxiety and stress. While this review provides an overview of intervention research of mindfulness programs with primary and secondary students, the authors did not describe their search, selection, or coding process and did not quantitatively synthesize effects of the interventions.

While the Mieklejohn et al. (2012) study is the most directly relevant review of mindfulness based interventions to the proposed C2 review, three additional reviews that include studies with children and youth have been published. Burke (2010) conducted a review of mindfulness-based approaches with children and adolescents and identified 15 studies (6 used a between-group design) that met review criteria that included: articles written in English and studies that used secular contemplative mindfulness mediation techniques. The author conducted a search for studies in 12 research databases and although the author did not limit the review to published studies, a comprehensive search for grey literature was not conducted and dissertations or conference papers were not accessed. This review included studies of mindfulness with clinical and non-clinical samples, but not all included studies are relevant to education (e.g., outpatient gastroesophageal reflux, body weight) and only four were conducted in school settings. Eight of the studies included in the Burke review were also included in the Mieklejohn review. The two other identified reviews were not specifically focused on children or education, but did include some studies of mindfulness-based

approaches with children and/or youth and in school settings. One review included 7 studies examining mindfulness interventions with persons with intellectual disabilities (Chapman et al., 2013) using a systematic method for searching and selecting studies, but a narrative synthesis method. The last review (Hwang & Kearney, 2013) included 12 studies examining interventions with persons ages 13-43 with mild to severe developmental disabilities using a systematic method for search, selection and coding of studies and a narrative synthesis method. These four reviews point to feasibility and relevance of mindfulness-based approaches in educational settings and promising effects of mindfulness-based approaches with children and adolescents on outcomes relevant to education.

The aforementioned reviews contribute to our understanding of mindfulness-based approaches with children and youth; however, prior reviews are limited by either using non-systematic and narrative methods or are not directly relevant to education settings, thus limiting their applicability to informing practice and policy in education. A comprehensive and systematic review and meta-analysis that specifically addresses mindfulness in educational settings using a systematic and transparent approach to search, selection and coding of studies and quantitative analysis techniques is needed to review and analyze current mindfulness-based approaches in school settings to both identify effects of interventions as well as gaps in the current evidence base to provide direction for practice, policy and future research in this growing area of practice and research.

INTERVENTION

Studies eligible for this review will examine the effectiveness of school-based interventions that use a mindfulness-based approach to affect student level outcomes in a school setting. Mindfulness is broadly defined as “self-regulation of attention to the conscious awareness of one's immediate experiences while adopting an attitude of curiosity, openness, and acceptance” (Bishop et al., 2004, p. 174). While definitions and mindfulness practices vary across studies, “most involve focusing non-judgemental attention on moment-to-moment private experiences, such as breath, thoughts, physical sensations, or other external aspects of the environment” (Thompson, 2008, p. 398). For the purposes of this review, mindfulness-based interventions include methods for teaching mindfulness awareness where participants are encouraged to focus their attention either on a covert activity (e.g., thoughts, feelings, urges) or overt activity (e.g., lights, sounds, smells). Mindfulness interventions include present moment work, meditation, relaxation skills training, breathing techniques and awareness of moment techniques delivered in vivo, via formal meditation practices or informal mindfulness exercises. Some specific interventions eligible include, but are not limited to, Mindfulness Based Stress Reduction (MBSR), Mindfulness Based Cognitive Therapy (MBCT), Learning to BREATHE, Inner Kids Program, and Acceptance and Commitment Therapy (ACT).

We will include studies that use multi-component interventions as long as one of the components is a mindfulness strategy. Mindfulness-based interventions targeting parents or

staff/teachers intended to indirectly affect student outcomes will be excluded from this review. Interventions that teach Yoga, relaxation training, or meditation, unless mindfulness techniques are also employed, will be excluded from this review.

POPULATION

Participants will be school-age children in regular education, special education or alternative education settings from any geographic area. Studies that include participants in inpatient hospital or detention settings will be excluded from this review.

OUTCOMES

Studies must report at least one of the following outcomes:

- Cognitive or academic performance (e.g., standardized achievement tests, measures of content mastery, reading, grades, cognition, memory)
- Behavior (e.g., disciplinary referrals, aggression and other externalizing behaviors, time on task, compliance, attendance)
- Socio-emotional (e.g., self-regulation, anxiety, stress, engagement, social skills, self-esteem, emotion regulation)

Measurement of above outcomes may be conducted using standardized or unstandardized instruments and may be self-, parent-, or teacher reported or researcher administered measures.

STUDY DESIGNS

To be included in this review, studies must use one of the following research designs: randomized controlled trial (RCT), quasi-experimental design (QED), single-group pre-post test design (SGPP) or single subject design (SSD). For RCT and QED studies, wait list control, no treatment, treatment-as-usual and alternative treatment groups will be considered acceptable comparison groups. The type of comparison group used in each study will be coded and examined as a moderator. Although it is not typical for single-group or single subject designs to be included in Campbell reviews, these study designs are being used in this area and we believe it is important to provide a comprehensive picture of the state of evidence related to mindfulness-based interventions in school settings. We will synthesize effects of each study design separately as Campbell guidelines require and will assess and report quality and bias of all included studies.

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Review Authors

Lead review author: The lead author is the person who develops and co-ordinates the review team, discusses and assigns roles for individual members of the review team, liaises with the editorial base and takes responsibility for the on-going updates of the review.

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ROLES AND RESPONSIBILITIES

Please give a brief description of content and methodological expertise within the review team. It is recommended to have at least one person on the review team who has content expertise, at least one person who has methodological expertise and at least one person who has statistical expertise. It is also recommended to have one person with information retrieval expertise. Please note that this is the *recommended optimal* review team composition.

- **Content:** Brandy Maynard and Veronica Miller will be responsible for the substantive content related to mindfulness. Maynard has been trained in and implemented Dialectical Behavior Therapy and Miller also has been trained in mindfulness techniques. Solis will provide content area expertise related to educational research and outcomes.
- **Systematic review methods:** Brandy Maynard and Michael Solis have significant experience and expertise in systematic review methods. Both Maynard and Solis have completed and published multiple systematic reviews/research syntheses. In addition, Maynard has been trained in C2 methods and is actively involved in C2- she has produced two Campbell reviews and is co-author on two additional reviews, is an editorial board member of the ECG, is a C2 methods trainer, and has been elected as co-chair of the social welfare group. Solis also participated in two days of C2 methods training at the 2013 C2 Colloquium.
- **Statistical analysis:** Brandy Maynard will be responsible for statistical analysis. Maynard has been trained in meta-analytic techniques and Maynard and Solis have conducted several meta-analyses.
- **Information retrieval:** Maynard, Solis, and Miller are experienced in information retrieval. Maynard and Solis will also consult with information retrieval specialists within their institutions in the planning and execution of the search strategy. Dollars have also been budgeted to consult and procure services from an information retrieval specialist to search specialized, foreign databases to which the review team does not have experience or access.

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POTENTIAL CONFLICTS OF INTEREST

The review team declares no potential conflicts of interest.

PRELIMINARY TIMEFRAME

Note, if the protocol or review are not submitted within 6 months and 18 months of title registration, respectively, the review area is opened up for other authors.

- Date you plan to submit a draft protocol: August 29, 2014
- Date you plan to submit a draft review: July 31, 2015

AUTHOR DECLARATION

Authors' responsibilities

By completing this form, you accept responsibility for preparing, maintaining, and updating the review in accordance with Campbell Collaboration policy. The Coordinating Group will provide as much support as possible to assist with the preparation of the review.

A draft protocol must be submitted to the Coordinating Group within one year of title acceptance. If drafts are not submitted before the agreed deadlines, or if we are unable to contact you for an extended period, the Coordinating Group has the right to de-register the title or transfer the title to alternative authors. The Coordinating Group also has the right to de-register or transfer the title if it does not meet the standards of the Coordinating Group and/or the Campbell Collaboration.

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5/20/2014