

An Examination of Mindfulness-Based Programs in US Medical Schools

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Abstract Some medical schools have begun introducing mindfulness concepts to their students, and academic mindfulness centers associated with medical schools (AMCAMS) have started to emerge. However, knowledge of the expansion of mindfulness-based interventions within academic medical institutions is primarily anecdotal. The study objective was to evaluate the scope of mindfulness-related activities across medical schools in the USA and to identify AMCAMS and their programmatic characteristics. First, we conducted a systematic website content search to evaluate mindfulness activities related to wellness, research, clinical use, and education among the 140 accredited US medical schools. Second, we surveyed AMCAMS directors to query the type of programs offered, the type of professionals participating at AMCAMS, and approaches for financial sustainability. Website content analysis showed that mindfulness-related activity was present at 79 % of US medical schools in 2014. Activities for wellness (87/140; 62 %) and research (69/140; 49 %) were most common. A potential AMCAMS was identified at 27 % (38/140) of medical schools, and 33 of 38 directors at those centers completed our survey (87 % response rate). AMCAMS directors reported that the most commonly offered program was Mindfulness-Based Stress Reduction (MBSR) followed by Mindful Movement and Mindfulness-Based Cognitive Therapy (MBCT). Private-pay MBI groups (21/33; 64 %),

private donations (17/33; 52 %), and fee-for-service billing (16/33; 48 %) were the most common contributors to financial sustainability. This is the first effort to collect data on all mindfulness-based programming within US medical schools and the first study to describe and identify AMCAMS characteristics. We discuss next steps for research on AMCAMS and dissemination of mindfulness in medicine.

Keywords Mindfulness · Mindfulness-based interventions · Medical school · Medicine · Sustainability · Mindfulness center

Introduction

Mindfulness meditation is a mind-body integrative medicine approach gaining popularity across North American health care settings to help people better live their life while encountering the challenges posed by stressors, symptoms, and illness (Black 2014; Buchholz 2015; Gilbert and Waltz 2010; Ludwig and Kabat-Zinn 2008). Training in mindfulness is the systematic procedure for honing in on and sensitizing the innate human capacity to inhabit more fully the present moment and welcoming as best one can, the full range of one's experience, pleasant, unpleasant, and neutral (Black 2014). Mindfulness-based interventions (MBIs), the modern and secular programmatic packaging of mindfulness meditation, are recognized by the National Institutes of Health and represent a rapidly growing area of medical research and practice that can potentially benefit both physicians and patients (Black 2014; Cullen 2011; Epstein 1999; Holzel et al. 2011; Ludwig and Kabat-Zinn 2008). Recent randomized clinical trials and reviews of the scientific evidence support some beneficial effects of MBIs for the remediation of anxiety, depression, and psychological suffering associated with pain, chronic illnesses, and other stress-

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related conditions (Black et al. 2015; Black and Slavich 2016; Bowen et al. 2014; Goyal et al. 2014; Niazi and Niazi 2011; O'Reilly et al. 2014; Segal et al. 2010).

Anecdotal reports as well as press stories suggest a substantial growth in access to MBIs offered within medical training and residency programs and increased options for patients receiving care at academic medical centers (Dobkin and Hutchinson 2013; Goldhagen et al. 2015; Pickert 2014; Roach et al. 2015). Further, several academic medical centers have published research on clinical and wellness programs for staff that incorporate mindfulness teachings and practices (Galla et al. 2015; Krasner et al. 2009; Li et al. 2016; Talisman et al. 2015; West et al. 2014). There is concern over whether mindfulness may be just a “trendy formulation” or “passing fashion” that will fade away before becoming widely integrated as a standard part of medical education and healthcare delivery systems (Hutchinson and Dobkin 2009; Kahn 2015). As yet, no empirical and systematic efforts have been made to determine the actual scope or sustainability of MBIs in medical schools and academic hospital systems within the USA.

Given that psychological distress and burnout in physicians and trainees are central occupational issues in medical education, mindfulness has received increased attention as a potential approach for integration within medical education curricula. Empathy declines dramatically as medical students progress through medical school, and this change coincides with students and medical resident reports of high rates of burnout, depression, and psychological distress (Chang et al. 2012; Dyrbye et al. 2006; Neumann et al. 2011; Prins et al. 2007). Physicians are in no way impervious to this psychological toll (Shanafelt et al. 2009). Thus, making evidence-based resources for protecting against distress and burnout accessible to those involved in medical education is needed. Research has demonstrated reduced psychological distress in medical students who receive mindfulness training (de Vibe et al. 2013; Phang et al. 2016; Phang et al. 2015; Rosenzweig et al. 2003; Shapiro et al. 1998). Mindfulness training for practicing physicians has also been correlated with decreased burnout and improved empathy (Amutio et al. 2015; Beckman et al. 2012; Irving et al. 2009; Krasner et al. 2009). It has been argued that mindfulness training can help healthcare professionals gain awareness of the automaticity of an “other focus,” a “fix it” mentality, and perfectionistic tendencies (Irving et al. 2012). Mindfulness training may even reduce medical errors and support rational clinical decision-making by limiting “mind-wandering,” which has been consistently linked with cognitive errors and negative mood states (Berner 2011; Hilton 2011; Smallwood et al. 2011).

Little empirical evidence has been published about the nationwide extent of mindfulness activities being offered at medical schools in the USA. Dobkin and Hutchinson (2013) identified 14 medical/dental schools throughout the world

with mindfulness as part of the curriculum; however, the study has not been replicated. Considering that most medical innovation in the USA occurs in academic medical centers, understanding the prevalence and scope of MBIs could shed light on the acceptance of MBIs within US medical culture. Similarly, while reports suggest the presence of several “mindfulness centers” associated with medical schools that are involved in MBI implementation, training, and dissemination, this phenomenon has never been studied empirically and little is known about the size, scope, operational sustainability, and nature of their role in medical education in the USA (American Mindfulness Research Association 2016).

The primary aims of the first stage of the study were to describe mindfulness-related activity occurring at US medical schools and affiliated universities and ascertain the number of academic mindfulness centers associated with medical schools in 2014. The primary aims of the second stage of the study were to determine which MBIs are commonly provided by these mindfulness centers, to identify the types of healthcare trainees involved in these centers, and to characterize their sustainability operations.

Method

To address the first aim, the study investigators conducted a systematic search for mindfulness-related activities at the 140 medical schools accredited by the Association of American Medical Colleges (AAMC) and their 123 affiliated universities, provided the universities were within a 50-mile radius and the university-situated activities were engaged with, or available to, medical students, patients, or health care staff. This was accomplished via a screening algorithm applied to the Google search engine, consisting of “(medical school name) AND mindfulness” and “(university name) AND mindfulness.” The top 20 “website hits” were evaluated by a doctoral-level member of the research team. In total, 263 Google searches were conducted and 5260 web links investigated. Mindfulness-related activities were coded into one of the following categories: clinical activity, medical school curricular activity, student/staff wellness activity, and research activity. Activities not clearly fitting a single category were discussed by three team members and categorized by consensus. This search algorithm was also used to screen for potential academic mindfulness centers associated with medical schools (AMCAMS). Inclusion criteria for potential AMCAMS were the following: has a website, identifies itself as a distinct administrative entity (e.g., center, institute, division, collaborative, program, etc.), offers at least one MBI, and has an affiliation with a medical school. Centers that met the inclusion criteria and whose directors responded with confirmation of their existence as a distinct administrative entity

(e.g., center, institute, division, collaborative, program, etc.) were considered an AMCAMS.

To address the second aim, potential AMCAMS were contacted via email to their directors, providing them personalized passcodes to complete a secure and confidential online survey. Directors were required to provide informed consent prior to accessing the survey, which was approved by the Cambridge Health Alliance Institutional Review Board. Weekly email reminders were sent to the identified directors for up to 10 weeks. If no reply was received within 4 weeks, emails were sent to up to 10 potential contacts at the center requesting the email invitation be forwarded to the center's director. If there was still no response after 8 weeks, then a written letter was sent by mail. The survey inquired about AMCAMS logistics (sources of revenue, number of participants, number of courses taught, number of full-time employee equivalents), types of trainees involved in AMCAMS, and AMCAMS focus (integrative medicine focus versus exclusive mindfulness focus). One respondent was excluded due to response inconsistencies. Descriptive statistics for the primary aims are reported.

Results

According to the findings of our internet search, the majority of US medical schools (111/140; 79 %) provide online information about mindfulness activities that are accessible to medical trainees in 2014; the most common types of activities are wellness related (87/140; 62 %) and research (69/140; 49 %). About 34 % (47/140) of medical schools or affiliated academic hospitals offer MBIs to patients in clinical settings, while 31 % (43/140) of medical schools embed mindfulness opportunities within the medical education curriculum (Table 1).

Nearly a quarter of medical schools (33/140; 24 %) have an associated AMCAMS. The survey generated information about potential AMCAMS with a high response rate (33/38; 87 %). Survey results indicate (14/33; 42 %) of responding centers primarily focus on MBIs, whereas (18/33; 55 %) offer

MBIs within a larger focus on integrative medicine in general. Mindfulness Meditation (MM) was offered at (29/33; 88 %) the majority of AMCAMS. The most commonly reported MBI was Mindfulness-Based Stress Reduction (MBSR) (22/33; 67 %) followed by Mindful Movement (MMOV) (13/33; 39 %) and Mindfulness-Based Cognitive Therapy (MBCT) (13/33; 39 %) (Fig. 1). MBI class fees were the most commonly reported source of AMCAMS revenue (21/33; 64 %), followed by private donations (17/33; 52 %), and fee-for-service billing (16/33; 48 %). Nearly half of AMCAMS report research funding (14/33; 42 %); and nearly a quarter (7/33; 23 %) report billing insurance companies for services provided. AMCAMS directors reported MBI class fees as the most important source of financial sustainability by substantial margins, followed by research grants, and fee-for-service billing, respectively (Fig. 2). Formal involvement of medical students in AMCAMS programming is common (20/33; 61 %), and medical residents, psychology trainees, and psychiatry residents are involved to varying degrees (Fig. 3). The mean number of full-time employee equivalents was 12 (median = 5; range = 1–60). The mean number of MBI courses offered at centers per year was 15 (median = 10; range = 3–50). The mean number of MBI participants per year was 447 (median = 300; range = 0–2648).

Discussion

This study provides a national snapshot of the prevalence and scope of mindfulness activity in academic medicine institutions in 2014. The finding that nearly 80 % of US medical

Table 1 Mindfulness-related activities categorized by wellness, research, clinical practice, and curriculum: Google search algorithm results

Web search results	% of medical schools
Any mindfulness-related activity	111/140 (79 %)
Mindfulness activity for wellness	87/140 (62 %)
Mindfulness-related scientific research	69/140 (49 %)
Mindfulness-related clinical activities	47/140 (34 %)
Mindfulness in medical curriculum	43/140 (30 %)
Has all 4 types of activities	26/140 (19 %)
Associated with an AMCAMS	33/140 (24 %)

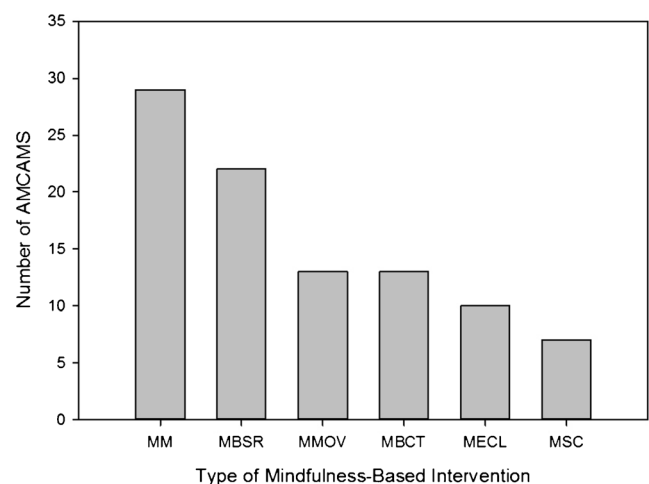


Fig. 1 Most common mindfulness-based interventions offered by Academic Mindfulness Centers Associated with Medical Schools (AMCAMS) as reported by AMCAMS directors in a 2014 survey ($n = 33$). *MM* Mindfulness Meditation, *MBSR* Mindfulness-Based Stress Reduction, *MMOV* Mindful Movement, *MBCT* Mindfulness-Based Cognitive Therapy, *MECL* Mindful Eating, Conscious Living, *MSC* Mindful Self-Compassion

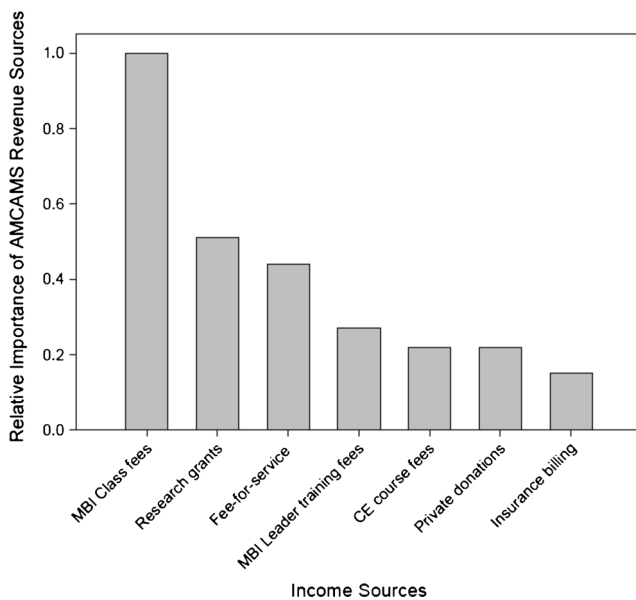


Fig. 2 Relative importance of revenue-generating activity to Academic Mindfulness Centers Associated with Medical Schools (AMCAMS) sustainability, as reported by AMCAMS directors in a 2014 survey ($n = 24$). For this question, 24 of 33 center directors responded to the request to rank the first, second, and third “most important” revenue sources for their center’s financial sustainability. The relative importance ratio was calculated using a weighted algorithm adding up the positive responses for each revenue source, with first, second, and third ranks earning 3, 2, and 1 points for each revenue source, respectively. All sources were then standardized to MBI class fees, which was the most important source of financial sustainability for AMCAMS

schools and/or their affiliated universities had some form of mindfulness activity demonstrates a surprisingly high level of penetration of this intervention in US medical schools and their associated universities. The finding that 62 % of schools

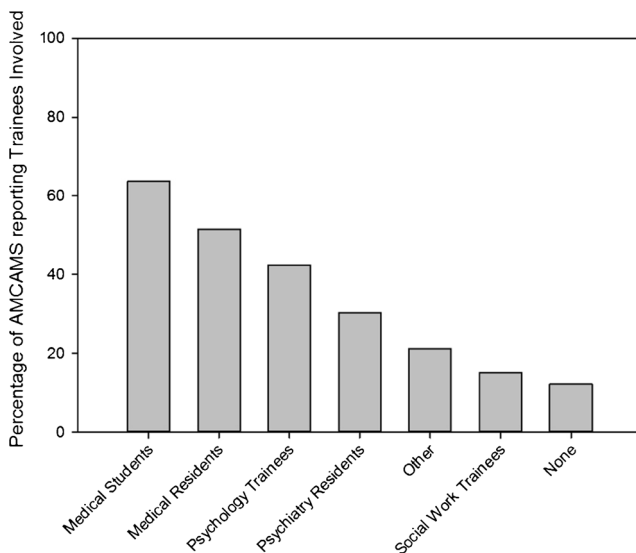


Fig. 3 Level of Formal Involvement of Trainees in Academic Mindfulness Centers Associated with Medical Schools (AMCAMS), as reported by AMCAMS directors in a 2014 survey ($n = 33$)

offered wellness-related mindfulness programs accessible to medical students suggests that “mainstream” academic medicine has been relatively receptive to mindfulness at least as a means of voluntary involvement in self-care. If future research efforts result in up-to-date, nationwide identification of a list of AMCAMS and annual publication of levels of mindfulness activities at various medical schools, it is likely that medical students, resident physicians, and attending physicians will become increasingly aware of the mindfulness resources accessible to them for wellness and self-care at their own institution. Additionally, since 49 % of schools had mindfulness-related research, it appears that mindfulness has become an increasingly established area of clinical research within many US academic medical institutions. By identifying school with mindfulness-related research activity and mindfulness centers at various medical schools, medical students and resident physicians may become more aware of potential opportunities for engaging in the mindfulness research and practice during and after training.

While mindfulness for promoting wellness has achieved widespread attention, the finding that nearly one in every four medical schools in the USA has an associated mindfulness center delivering MBIs suggests that evidence-based mindfulness programs have established an organizational and administrative foothold at nearly a quarter of medical schools, even as replicable implementation models and sustainable clinical delivery systems are still being established in the USA (Cullen 2011; Galla et al. 2015; Goldhagen et al. 2015; West et al. 2014). These mindfulness centers affiliated with medical schools (AMCAMS) seem to be current vehicles for dissemination of mindfulness-related research and training in mindfulness-based interventions and may be a potential access point for future nationwide evaluative studies. Also, the UK recently announced a coordinated nationwide dissemination effort for MBCT with a proposal of employing at least 1200 certified MBCT clinicians in the National Health Services by 2020 (Mindfulness All-Party Parliamentary Group 2015). Further research into AMCAMS in the USA will be needed in case there is ever a consensus on the possible benefits of a similar process as is underway in the UK. AMCAMS would be the obvious candidates for potential training nodes in any dissemination network of evidence-based practices. The initial data collected in this study offer a cross-sectional view of how existing AMCAMS were operated, funded, and staffed during 2013–2014. This study’s findings demonstrate the diverse size and nature of these centers and the services they offered, as well as the diversity of revenue sources sustaining them. These results, if viewed in comparison to future data, may be used to monitor the potential development of mindfulness within academic medicine over time.

This study had several novel findings that may impact the integration of mindfulness into medical education as well as implementation and dissemination of MBIs into academic medical practice. Importantly, this study found that nearly two thirds of US medical schools had mindfulness-related wellness offerings accessible to medical students, which suggests that it has become an option for medical students to use in the management of self-care and burnout. Additionally, this study found that 7 of 33 AMCAMS are billing insurance for mindfulness-based interventions with patients, which could motivate other centers to pursue a similar sustainability strategy. Finally, the study found that approximately half of responding centers reported that they identify primarily as a mindfulness center, whereas the other half offer MBIs while identifying as a broader integrative medicine or mind-body medicine center (Horrigan et al. 2012). This finding reflects the emergence of two possibly distinct types of AMCAMS, representing two potentially different successful implementation strategies.

This study provides a starting point for further research regarding the dissemination of mindfulness-based interventions within academic medicine. Further research could explore the extent to which medical students and physicians utilize the MBIs available at their institutions. Subsequent studies could investigate whether the mindfulness offerings in medical school curricula are required versus elective, as schools tend to require what they deem most valuable. Furthermore, it would be useful to understand which types of medical school faculty are conducting mindfulness research. Additional studies could identify the proportion of staff physicians conducting MBI clinical research at a medical school in comparison with the larger number of psychologists researching MBIs. Also, if a future study were to find increasing levels of participation by staff physicians in the conduct of clinical MBI research, this could represent a higher level of integration of MBI research into the medical training institution than research conducted by affiliated research faculty. Finally, additional studies could provide information about the extent of integration of MBIs into curriculum by assessing the mean number of contact hours per medical student or resident per year.

This is the first effort to collect data on all mindfulness-based programming within US medical schools. Findings provide the first nationwide snapshot of the scope of AMCAMS and their programmatic elements. Mindfulness approaches are reportedly used, but to a yet unknown extent, by the majority of medical schools across the nation based on online content, and just under a third of medical schools have developed a center that delivers MBIs. Further research is needed to clarify how “mainstream” this modality actually is in the day-to-day operations of academic medicine.

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Compliance with Ethical Standards

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Ethical Approval Ethical approval has been granted by the Institutional Review Board of Cambridge Health Alliance on 5/2/2014, Reference number CHA-IRB-0990/05/14.

The work was carried out in accordance with the Declaration of Helsinki, including, but not limited to the anonymity of AMCAMS directors being guaranteed, and the informed consent of participants was obtained.

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