



# Brief Online Mindfulness Training: Immediate Impact

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## Abstract

**Background.** Online training is feasible, but the impact of brief mindfulness training on health professionals needs to be better understood. **Methods.** We analyzed data from health professionals and trainees who completed self-reflection exercises embedded in online mindfulness training between May 2014 and September, 2015; their changes in mindfulness were measured using standardized scales. **Results.** Participants included nurses (34%), physicians (24%), social workers and psychologists (10%), dietitians (8%), and others (25%); 85% were women, and 20% were trainees. The most popular module was Introduction to Mindfulness (n = 161), followed by Mindfulness in Daily Life (n = 146), and Mindful Breathing and Walking (n = 129); most (68%) participants who took 1 module took all 3 modules. There were no differences in participation in any module by gender, trainee status, or profession. Completing modules was associated with small but significant improvements on the Cognitive and Affective Mindfulness Scale–Revised, the Mindful Attention Awareness Scale, and the Five Facet Mindfulness Questionnaire ( $P < 0.001$  for all). **Conclusion.** Online training reaches diverse health professionals and is associated with immediate improvements in mindfulness. Additional research is warranted to compare the long-term cost-effectiveness of different doses of online and in-person mindfulness training on clinician burnout and quality of care.

## Keywords

mind-body, meditation, education, mindfulness, online

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Many health professionals suffer from burnout, which threatens professionalism.<sup>1-8</sup> Also called compassion fatigue, burnout can adversely affect empathic communication, relationships, and clinical care. Because burnout has adverse personal and professional consequences,<sup>6,9</sup> programs that address stress and burnout have become priorities.<sup>10-14</sup>

Mindfulness-based stress reduction has become a popular strategy to improve health professionals' mindfulness, decrease burnout, and improve patient care.<sup>15-20</sup> Mindfulness has been defined as paying attention in a particular way—on purpose, to the present moment, nonjudgmentally.<sup>18,21</sup> In previous research, we found that it was correlated with greater resilience and less burnout<sup>22,23</sup>; other studies suggest that mindfulness training enhances health professionals' resilience.<sup>24,25</sup> However, most mindfulness-based stress reduction training requires in-person group meetings of 2.5 hours per week for 8 weeks, and sometimes includes ongoing “booster” sessions monthly, though some programs offer abbreviated training.<sup>20</sup>

As work demands and stress increase, health care professionals may be unwilling to commit to time-consuming training without the prospect of immediate benefit. In a national survey of nurses, convenience was rated as the most important factor influencing a choice of stress-management training.<sup>26</sup> Briefer training is desirable, but

different studies have shown mixed effects of brief training on burnout, stress, and empathy.<sup>27-33</sup>

Our prior study evaluating the feasibility of online mind-body skills training showed that diverse health professionals readily enrolled in online training.<sup>34</sup> For this project, we focused on 3 topics related to training in mindfulness skills: (a) Introduction to Mindfulness, (b) Mindfulness in Daily Life, and (c) Mindful Walking and Breathing. Specifically, we wanted to answer 3 questions.

1. What kinds of health professionals and trainees enroll in online mindfulness training?
2. Which of the three topics are most popular? And would those who enrolled in one topic also enroll in others?

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3. Is completing an online module associated with any immediate changes in mindfulness as measured using standardized instruments?

## Methods

### Design

This was a prospective cohort study. We used data collected as part of an ongoing online elective educational program in mind-body skills training at a large Midwestern academic health center between May 1, 2014 and September 1, 2015.

### Participants

There were 2 enrollment periods: (a) the first 3 months when recruitment focused on trainees and (b) thereafter opening enrollment to allow faculty and staff to participate. From May 1 to July 31, 2014, participants were recruited by email and focused on entering graduate trainees in the health professions and residents. Approximately 450 individuals received a direct email inviting them to participate. We did not count email “bounces.”<sup>35,36</sup> On August 1, 2014 registration was opened throughout the academic health center, and announcements about the new Continuing Medical Education–approved course were made on university websites and e-newsletters. The program was offered for free, voluntary, and not associated with course credit. No deadlines were imposed on completing modules. As per institutional policy, the course was free to Ohio State University (OSU) students, faculty, and staff, but there was a nominal charge for non-OSU registrants.

### Registration Data

During registration, participants were asked to note their profession. Because they were not relevant for teaching purposes, data on age, race, and ethnicity were not requested. Profession was categorized 2 ways: (a) trainee (students, residents, and fellows) versus practicing professional and (b) health professionals were categorized as dietitians/nutritionists, nurses (clinical nurse specialists, advanced practice nurses, and other nurses), physicians, social workers and psychologists (including licensed professional counselors), and others (including researchers, dentists, laboratory technicians, physical and occupational therapists, and others).

### Curriculum

The curriculum (<http://mind-bodyhealth.osu.edu>) was described to potential participants as a way to help health professionals become more personally resilient and to be more effective in helping patients manage stress. The mindfulness training included three 1-hour modules: (a) Introduction to Mindfulness, (b) Mindfulness in Daily Life, and (c) Mindful Breathing and Walking. Participants were allowed to complete the modules in any order. For this project, we focused on participants who enrolled in any of the 3 mindfulness modules and completed the self-reflection exercises imbedded in them.

### Module Organization, Content, and Self-Reflection

Each module began with a case. Modules also included clinically relevant didactic information about mindfulness with hyperlinks to

peer-reviewed research. Summary tables described the physiologic, cognitive, and clinical effects of mindfulness practices. To assist in clinical application, modules offered tips for teaching mindfulness skills to patients and resources such as books, articles, and websites. Each module included links to free, downloadable MP3 recordings of guided mind-body practices to support experiential learning. Audio recordings were paired with printed directions for the guided practices; there were also links to YouTube videos of mindfulness practices to support experiential learning for both auditory and visual learners. The length of the practice recordings varied from 5 to 20 minutes.

The initial case was followed by 1 to 3 self-reflection exercises, some of which were repeated at the end of the module. Self-reflection questions were included to engage learners and help them reflect on qualities that might be affected by mind-body training. The self-reflection opportunities were standard instruments to assess mindfulness (see below). For each standardized instrument, scores were automatically calculated within the web-based program, provided immediately to participants, and stored on the project’s servers. Only data from those who completed all items on pre- and post-self-reflection measures were included in this analysis.

### Measures

To avoid repetition, each of the 3 modules used a different, standardized mindfulness measure. The 10-item Cognitive and Affective Mindfulness Scale–Revised (CAMS-R) was used in the Introduction to Mindfulness module; Cronbach’s alpha for the CAMS-R is .76, and scores are strongly correlated with well-being and cognitive flexibility and inversely correlated with distress and maladaptive emotional regulation.<sup>37</sup> The 15-item Mindful Attention Awareness Scale (MAAS) was used as the self-reflection tool in the Mindfulness in Daily Life module; it has a 6-point summative rating scale, a Cronbach’s alpha of .80 to .87, a test-retest reliability of .81, and positive correlations with clarity, engagement, optimism, and vitality.<sup>38</sup> Baer’s 39-item Five Facet Mindfulness Questionnaire (FFMQ) was used in the Mindful Breathing and Walking module; it has a Cronbach’s alpha of .72 to .92 in different samples and moderate correlations with the CAMS-R and MAAS with higher scores found in meditators.<sup>39</sup>

### Expectations

Participants were told that changes were not necessarily expected with a single practice session, but that by developing the habit of self-reflection in conjunction with regular mindfulness practice, they might observe changes over time, as they would if they engaged in regular weight lifting.

### Data Management and Analysis

Data were extracted from the project servers and downloaded into a Microsoft Excel spreadsheet for analysis. After cleaning and sorting, the data were deidentified for analysis using simple descriptive statistics and paired *t* tests.

The project was approved by the OSU Office of Research Institutional Review Board as part of a larger evaluation of the impact of our overall health educational program, Skills Training in Integrative Therapies for Caring Health Professionals.

**Table 1.** Participants Who Completed Self-Reflection Exercises for Online Mindfulness Training.

Professional Group	Any Mindfulness Module, n (%)
No. of enrollees	178
Gender, male	27 (15)
From Ohio State University	148 (83)
Trainees	35 (20)
Profession	
Dietitian	15 (8)
Nurse, Medical Assistant, Advanced Practice Nurse	60 (34)
Physician	43 (24)
Social work, psychology, or licensed counselor	17 (10)
Licensed massage therapist	8 (5)
Other, including therapists, administrators, technicians, volunteers, human resources, staff, and others	35 (20)

## Results

Between May 1, 2014 and September 1, 2015, the 3 mindfulness modules had 229 participants for Introduction to Mindfulness, 210 participants for Mindfulness in Daily Life, and 166 participants for Mindful Breathing and Walking. The number (percentage) who completed both self-reflection exercises in each module were 161 (70%) for Introduction to Mindfulness, 146 (70%) for Mindfulness in Daily Life, and 129 (78%) for Mindful Breathing and Walking. Most (68%) participants completed all 3 modules.

The majority of enrollees were women (85%) and from OSU (83%); 20% were trainees in the health professions. A variety of health professionals enrolled, most commonly nurses (34%), physicians (24%), social workers/psychologists (10%), dietitians (8%), and massage therapists (5%); 20% included other health professionals such as physical and occupational therapists, laboratory and radiology technicians, volunteers, administrators, and human resources staff (Table 1).

Scores on the self-reflection exercises improved significantly from the beginning to the end of each of the modules (Table 2). For example, for the Introduction to Mindfulness module, average scores on the CAMS-R increased from 28.0 to 29.4 ( $P < .001$ ); for Mindfulness in Daily Life, scores on the MAAS increased from 59.0 to 62.3 ( $P < .001$ ); and for Mindful Breathing and Walking, total FFMQ scores increased from 145.8 to 154 ( $P < .001$ ). There were no significant differences in improvement in scores by gender or profession. Although the non-OSU participants tended to have higher scores on the initial self-reflection exercises for each module ( $P = .05$ ), the improvements in scores were similar for both OSU and non-OSU participants ( $P > .1$  for all comparisons).

## Discussion

The large and diverse sample that enrolled within a relatively short time frame highlights the public health relevance of

**Table 2.** Self-Reflection Scores at the Beginning and End of Each Mindfulness Module.

Module/Scale	Beginning; Mean $\pm$ SD	Ending; Mean $\pm$ SD	<i>P</i>
Introduction to Mindfulness			
Cognitive and Affective Mindfulness Scale—Revised, 10-item version	28.0 $\pm$ 5.5	29.4 $\pm$ 5.6	<.001
Mindfulness in Daily Life			
Mindful Attention Awareness Scale	59.0 $\pm$ 13.7	62.3 $\pm$ 14.3	<.001
Mindful Breathing and Walking			
Five Facet Mindfulness Questionnaire	132.8 $\pm$ 19.7	139.8 $\pm$ 21.7	<.001

Abbreviation: SD, standard deviation.

strategies to improve mindfulness and promote resilience in health professionals. The study had 3 major findings. First, mindfulness training appeals to diverse health professionals, and most of those who engage in 1 module (most often the Introduction to Mindfulness module) were willing to complete all 3 hours of training. Second, completing even brief, online training was associated with small but significant increases in mindfulness scores. Third, there were no apparent differences in improvement by gender, among the different health professionals, or between trainees and practitioners.

This project was unique in offering mindfulness training online to multiple, diverse health professionals. Most training programs group learners by profession.<sup>16,17,24,40-42</sup> While limiting enrollment to one profession may have some benefits for in-person training, it does not appear to be necessary for online learning. Although the preponderance of female participants may initially appear surprising, the fact that so many participants were from nursing, social work, dietetics, and other non-physician professional fields suggests that the sample actually reflects the composition of the health work force at many academic medical centers.

Our results support earlier studies suggesting that even brief training can lead to small but significant benefits for health professionals.<sup>20,32,43</sup> For example, the changes observed in our sample are similar to those observed by Sood et al<sup>32</sup> from Mayo Clinic who observed small but significant improvements in perceived stress, anxiety, and mindfulness (using the MAAS) following a 90-minute in-person training session and 2 follow-up phone calls. Not surprisingly, significant increases in mindfulness have been observed after lengthier interventions such as Krasner et al<sup>17</sup> who observed a full standard deviation increase in mindfulness (using 2 subscales of Baer's FFMQ) after 52 hours of in-person training. Showing that specific mindfulness training programs can be beneficial, and that online training may be comparable to more expensive in-person training<sup>44</sup> is important because other strategies, such as duty hour restriction, have not proven particularly effective in preventing burn-out.<sup>45</sup> Additional strategies are needed to help build resilience, maintain mindfulness, and improve the quality of care.<sup>46</sup> As

health care undergoes rapid change, there is likely to be an increased need for accessible, affordable, nonstigmatizing training to protect and promote clinicians' health and caring skills.

We were surprised to see immediate changes in mindfulness given this brief intervention, particularly after having told participants explicitly in each module that no immediate improvement was expected. In addition, the average scores in our sample on the CAMS-R and MAAS at baseline were already higher than those reported in the normative population in which they were developed,<sup>38,47,48</sup> so one might have expected ceiling effects to limit further improvement. Also, our participants' baseline FFMQ scores were higher than those observed after 8 weeks of in person mindfulness-based stress reduction training.<sup>49</sup> The improvement of slightly more than three points on the MAAS seen here is similar to that observed with a 6-week in-person training program.<sup>50</sup> This raises questions about ceiling effects in studies on MBST and whether briefer training might have similar effects as more expensive, lengthier, and demanding in-person training.

Although this study offers several unique and important observations, it also has several limitations and raises additional questions. It was conducted at one academic institution in the Midwest, and needs to be replicated in other settings. It had a large sample size, but the training was voluntary, and there was no randomization to a control intervention, so the results cannot be generalized to mandated or required programs. It examined immediate effects using standard instruments, but questions remain about the duration of the observed impact and whether additional training, booster training, or support groups might be helpful. What is the long-term uptake, impact, and cost-effectiveness of different types, formats (online vs in-person) and dosages (number of hours) of training for different types of health professionals? The changes were statistically significant, but small, and of unknown relevance for clinician burnout and the quality of patient care. These questions are important and will require additional prospective, controlled trials.

Despite these limitations, results of this study suggest that online training in mindfulness is attractive to diverse health professionals, and that even brief training can improve mindfulness in samples whose baseline levels of mindfulness may already be good. Additional research is warranted to compare the cost-effectiveness of online to in-person training to improve clinician mindfulness, burnout, and the quality of care provided to patients.

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### Ethical Approval

This project was approved by the Ohio State University Office of Research Institutional Review Board: 2013B0611.

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