

Mindfulness in Residency: A Survey of Residents' Perceptions on the Utility and Efficacy of Mindfulness Meditation as a Stress-Reduction Tool

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ABSTRACT

PURPOSE: Mindfulness meditation can help reduce burnout in medical students and attendings, yet has not demonstrated efficacy in residents. The authors surveyed internal medicine residents to determine their prior experience with and interest in mindfulness meditation.

METHODS: An anonymous survey was given to 130 internal medicine residents at the Alpert Medical School at Brown University during the 2016–2017 academic year. The survey assessed prior experience, perceived efficacy, and interest in learning about mindfulness meditation.

RESULTS: Of 104 completed surveys, 61% reported prior use of mindfulness and 25% reported current weekly or greater use. Eighty-seven percent of residents believed mindfulness meditation would help with stress reduction, and 87% were interested in receiving mindfulness training.

CONCLUSIONS: Though a minority of residents currently practice mindfulness meditation, most believe it is an effective stress reduction tool and are interested in receiving further training. These results support the inclusion of mindfulness training within residency wellness initiatives.

KEYWORDS: mindfulness; burnout; wellness; graduate medical education

INTRODUCTION

Mindfulness, the practice of attending to the present moment without judgement,¹ is a well-studied stress reduction tool² which has received increasing attention as a wellness resource for physicians.^{1,3,4} The recent surge in research on mindfulness for healthcare providers comes at a time when there is increasing focus on the impact of burnout on the physician workforce.⁵ Resident physicians are a subgroup that are highly susceptible to burnout, with a higher burnout prevalence than either medical students or early career physicians.⁶ Up to 70% of residents meet criteria for burnout during training.⁷ Detrimental effects range from medication errors,⁸ early discharges and treatment errors,⁶ to decreased empathy and increased guilt⁹; in light of this, the importance of combating burnout is undeniable.

Unfortunately, data on how to reduce burnout in residents is not yet definitive. In residents, duty-hour restrictions resulted in a slight decrease in burnout, but other interventions including scheduled sleep time and training in stress reduction and communication did not show a significant reduction when reviewed via a meta-analysis.¹⁰ Data in attending physicians is both more robust and more promising, though still with mixed results. A meta-analysis revealed moderate improvements in burnout with organizational-based changes, including decreased call, shorter shift length, and targeted quality-improvement and workflow projects. Physician-directed interventions including discussion groups and skill training resulted in small but significant improvements in burnout, though when examined individually some studies were less successful.¹¹

Mindfulness training has been shown to lead to improvements in burnout for attending physicians and medical students, in addition to other benefits, including improved well-being,⁴ improved empathy,^{3,4} and decreased distress and rumination.¹² The benefits of mindfulness have also been shown to have a direct impact on improving patient satisfaction and quality of care.¹³

Despite these recognized benefits, there remains a paucity of studies investigating the benefits of mindfulness for residents. Goldhagen et al demonstrated a modest, though not statistically significant, improvement in stress, burnout, depression and anxiety ratings within subgroups of residents following mindfulness training.¹⁴ A 2014 feasibility study also showed a trend towards increased mindfulness and empathy following a multifactorial wellness intervention, which included mindfulness activities, but again without significance when compared with pre-intervention assessments.¹⁵ Two other studies, one using mindfulness and art,¹⁶ and the other using smartphone mindfulness apps,¹⁷ showed improvement in mindfulness scales and trends toward improved positive affect. However, none of these studies have definitively demonstrated decreased burnout or stress following a mindfulness intervention in residents.

Across the academic community there have been multiple calls to action recommending more programs and research on wellness in residency,¹⁸ and more specifically on mindfulness.¹⁹ The question remains as to whether residents would benefit from mindfulness at all, and indeed whether they would be open to learning more about this stress-reduction

tool. No published studies to date have assessed resident baseline interest in mindfulness meditation; this question is important, as a perceived inefficacy or a lack of interest may limit the utility of mindfulness meditation for residents. To this end, we designed a survey to assess residents' prior experience with and openness to using mindfulness as a wellness tool.

METHODS

Study design and participant selection

We designed an anonymous, web-based survey using RED-Cap™ electronic data capturing software.²⁰ Author TT primarily developed the survey based on prior mindfulness training, and we revised it via a focus group among all three authors. We piloted our survey with Internal Medicine attending physicians at Brown University.

We distributed the survey electronically via email; reminder emails were sent every two to four weeks. The study population included the 130 enrolled Internal Medicine Residents at the Warren Alpert Medical School at Brown University during the 2016–2017 academic year.

Our study was reviewed by the Rhode Island Hospital Institutional Review Board and approved with exempt status on September 22nd, 2016. In accordance with IRB request, a cover letter was included with the survey, and participants who completed the survey were given a mindfulness meditation resource list. Participants did not receive compensation.

Survey content

The survey consisted of 27 questions assessing demographics, current well-being, and mindfulness. Questions were multiple choice, Likert scale and free text. The mindfulness questions specifically assessed prior experience including setting and type of practice; current mindfulness practice; beliefs about efficacy of mindfulness as a stress reduction tool; interest in learning more about mindfulness during residency including preferences in setting and content; and confidence in use of mindfulness in the future. The full survey is available on request.

Analysis

We used SAS® software (SAS Institute Inc., Cary, North Carolina) for data analysis and tabulating. Chi-square and Fisher analyses were performed for descriptive and bivariate analysis to report demographics and specifically to evaluate participant perception on efficacy of mindfulness.

RESULTS

Of 130 residents, 111 responded to the survey. We excluded seven incomplete surveys and considered 104 surveys for the analytical sample (80% response rate). The mean age of participants was 30 years old. Half of respondents were female,

and the majority identified as Caucasian race and had a partner. Survey responses came from all three years of training, though first years had the highest response rate. Participants also ranged across planned specialization, with the largest proportion planning on general medicine (n=31, 30%), with multiple other subspecialties represented. (Table 1)

A majority of residents had previously used mindfulness meditation (61%, n=63). About half were currently using mindfulness (54%, n=56) and one-quarter (n=26) were using it frequently (defined as weekly or more often). (Table 2) Prior mindfulness experience included a variety of practices, with mindful breathing as the most common (52 of 63, 82% of meditators) followed by sitting meditation (44 of 63, 70%). (Figure 1a) Residents had also practiced mindfulness in a variety of settings including alone (41 of 63, 65% of meditators) and in a yoga/exercise class (30 of 63, 47%) as well as other locations. (Figure 1b) Of residents who had previously practiced mindfulness, 86% (n=54) had practiced more than one type and 68% (n=43) had practiced in more than one setting. When comparing mindfulness use to baseline demographics, women were significantly more likely to practice

Table 1. Demographic characteristics of Internal Medicine residents at Brown University during the 2016-2017 academic year.

	Full sample size (n=104)	
	number	(%)
Age, mean (SD)	30.0	(2.6)
Male gender	52	(50.0)
Year of training		
PGY-1	43	(41.4)
PGY-2	35	(33.7)
PGY-3	26	(25.0)
Medicine Specialty		
General medicine ^a	31	(29.8)
Cardiology	13	(12.5)
Gastroenterology	12	(11.5)
Pulmonary/Critical care	6	(5.8)
Heme/Oncology	11	(10.6)
Other ^b	31	(29.8)
Race		
Black/Hispanic/Other	8	(7.7)
Asian	28	(26.9)
Caucasian	60	(57.7)
Prefer not to answer	8	(7.7)
Partnered ^c relationship	58	(56.9)
Current rotation		
Inpatient/Wards	54	(52.4)
ICU	12	(11.7)
Outpatient/Elective	37	(35.9)

Notes: a – General medicine includes primary care, general hospitalist and academic general internal medicine; b – All others not listed above; c – Married, living with partner, or divorced. Abbreviations: PGY – postgraduate year; ICU – intensive care unit; SD – standard deviation.

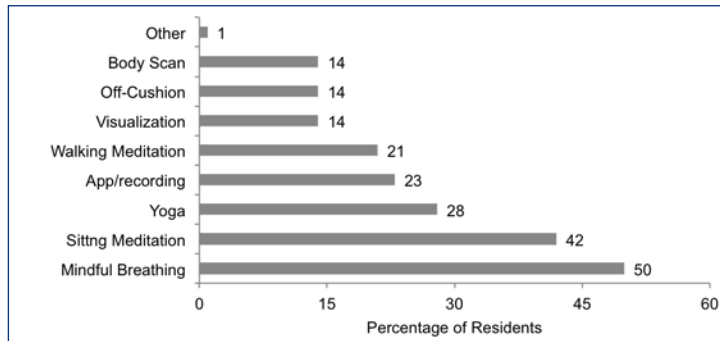
Table 2. Experience with and interest in mindfulness meditation among Internal Medicine Residents at Brown University.

	Full sample size (n=104) number (%)
Any prior experience with mindfulness meditation	
Yes	63 (60.6)
No	37 (35.6)
Don't know	4 (3.9)
Current use of mindfulness meditation	
Not at all	48 (46.2)
Sometimes ^a	30 (28.9)
Frequently ^b	26 (25.0)
Interest in receiving training in mindfulness meditation	
Not all interested	14 (13.5)
Slightly/Somewhat interested	58 (55.8)
Moderately/Extremely interested	32 (30.7)
Likelihood of starting or continuing mindfulness meditation use	
Extremely unlikely/Unlikely	27 (26.0)
Neutral	36 (34.6)
Likely/Extremely likely	41 (39.4)

Notes: a – rarely to monthly; b – weekly to daily

Figure 1. Internal Medicine residents' prior experience with mindfulness meditation. Percentage of residents who had previously participated in (A) each of the listed meditation types and (B) each of the listed meditation practice settings. (n=104)

A. What types of meditation have you previously practiced?



B. In what setting have you previously practiced meditation?

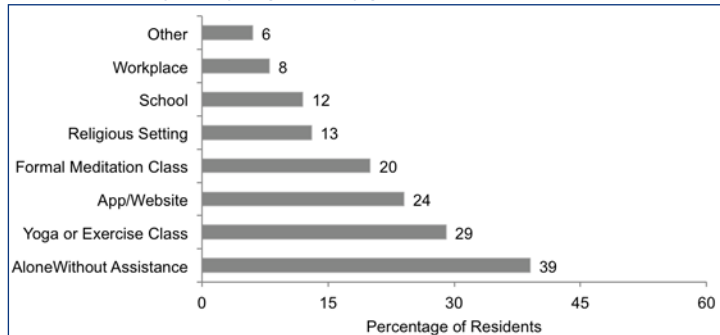


Figure 2. How effective is mindfulness meditation as a stress-reduction tool? Residents' perception of efficacy of mindfulness as a stress-reduction tool for the general population and for the participant personally. There was an overall significant difference between residents who thought mindfulness would be effective in general versus those who thought it would be personally effective (96% versus 87%, p-value < 0.01; n=103).

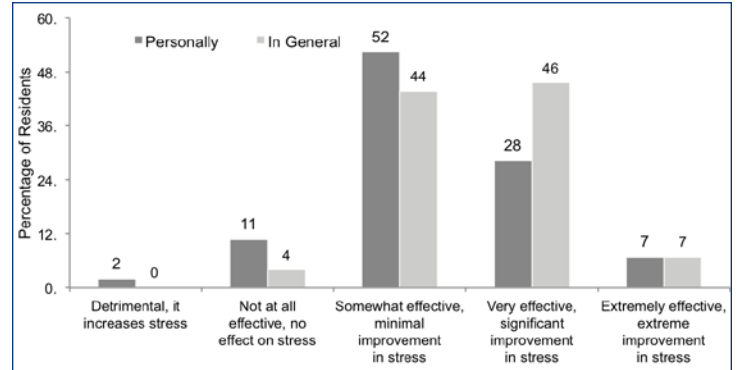
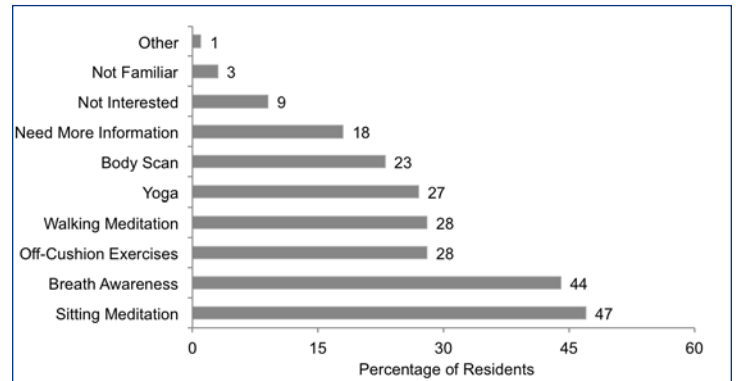
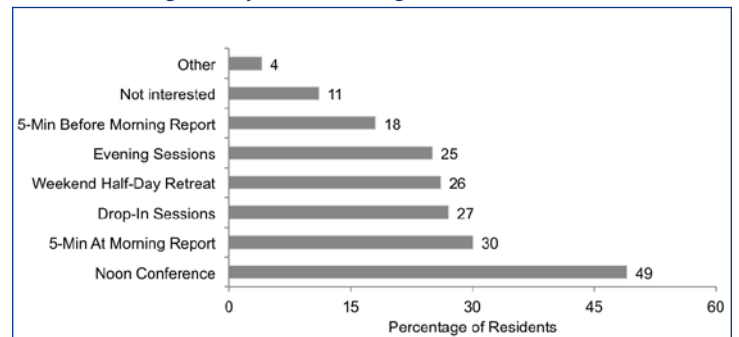


Figure 3. Internal medicine resident interest in learning about mindfulness meditation: (a) preferred type of mindfulness training and (b) preferred setting of future training sessions. (n=104)

A. Which type of mindfulness technique would you most like to learn about?



B. In what setting would you find learning about meditation most beneficial?



mindfulness than men (71% versus 50%, p -value = 0.03).

Nearly all participants believed that mindfulness was an effective stress reduction tool in general (96%, $n=99$), and 52% believed it would lead to significant or extreme improvements in stress ($n=54$). (Figure 2) However, significantly fewer residents believed that mindfulness would benefit them personally (87%, $n=90$; p -value < 0.01). Two respondents (2%) thought that mindfulness would be detrimental to their stress level. (Of note, a single respondent did not answer this question; percentages are out of 103 responses.)

Most residents were interested in receiving further training in mindfulness meditation (87%, $n=90$), with 31% expressing a moderate or high level of interest. (Table 2) Participants wanted to learn about a variety of mindfulness types, with sitting meditation (47%, $n=49$) and breath awareness (44%, $n=46$) as the most popular, followed by walking meditation, yoga and body-scan. (Figure 3a) A majority of residents were interested in learning about two or more types of meditation (68%, $n=71$). Noon conference was the most commonly selected potential learning environment (49%, $n=51$) with other venues following in popularity. (Figure 3b)

Regarding anticipated future use of mindfulness meditation, 39% of residents felt that they were likely or extremely likely to use mindfulness meditation in the future. Thirty-five percent felt neutral about future use, and 26% ($n=27$) thought it was unlikely they would use mindfulness meditation. When comparing gender and anticipated ongoing use of mindfulness, significantly more women anticipated using mindfulness in the future when compared to men (50%, $n = 26$ vs 29%, $n=15$; p -value = 0.02).

DISCUSSION

This survey-based study of internal medicine residents shows that, among this population, most residents are both interested in receiving training in mindfulness meditation and believe that it is an effective stress-reduction tool. This is the first study to date examining baseline resident interest in and experience with mindfulness meditation and suggests that current efforts to introduce mindfulness into residency programs is likely in-line with resident interests. These results also suggest that the current lack of demonstrated efficacy of mindfulness programs for residents is unlikely to be related to a lack of interest. Furthermore, the demonstrated discrepancy between residents who believe mindfulness would personally benefit their stress level (87%) and the much smaller number who regularly use mindfulness (25%) and who plan on using it in the future (39%) highlights the sizable target population of a residency-based mindfulness initiative. We believe this is an exciting first step to inform the larger graduate medical education audience on the potential usefulness of mindfulness in residency training.

The results of this study also inform potential design of

such a mindfulness intervention. Most studies showing the benefit of mindfulness for attending physicians and trainees have been based on a time-intensive Mindfulness Based Stress Reduction format, which involves weekly 2.5-hour meetings and an additional 7 hours of homework per week.^{3,12,13} Such a format requires all participants to be available at the same time of day, as well as have predictable time available for independent practice. In contrast, our results show that residents prefer mindfulness training to be available across a variety of venues and times and are also interested in a variety of mindfulness types. This suggests that in order to capture the greatest number of residents, both in interest and availability, a residency-based training program should include a variety of mindfulness practices and venues. Studies outside the medical community have shown that brief mindfulness interventions, including a single 10-minute training session²¹ and four 20-minute sessions²² can have beneficial effects on brain function, mood and attention, even for novice meditators. Such brief training sessions, offered at different times of day and with different content, could be an achievable method for maximizing resident participation and efficacy.

Our data also highlight two additional areas of potential future research. First, significantly more woman than men both had prior experience with mindfulness and expressed confidence in using mindfulness in the future. These results align with Goldhagen et al, who found a trend toward reduced stress among women who participated in their mindfulness intervention when compared to men.¹⁴ Second, there was a significant difference between the number of residents who thought mindfulness would be beneficial in general versus for themselves personally (96% versus 87%, p -value < 0.01). Investigating the etiology of these discrepancies may lead to wider resident buy-in to using mindfulness and improved outcomes of an intervention.

Our study has several limitations. First, it is based in a single residency at a single institution, which limits the generalizability of our results. Second, the prevalence of mindfulness use in the study population was significantly higher than that of the general U.S. population.²³ We expect that this may be related to features that run across residencies, including a high level of education and higher income, which have previously been shown to correlate with mindfulness use.²³ However, it is also likely that the study population is biased towards meditation use in other ways that we cannot yet account for, which may limit generalizability to other programs.

Given our results as well as the limitations of our study, we hope other residencies will be inspired to do a needs-assessment and to design a mindfulness initiative that caters to the specific needs of their residents. Though we find these results encouraging, more study is most certainly needed to determine whether mindful practice over time will result in less resident burnout and more resilience.

CONCLUSION

We found that the majority of surveyed residents both had prior experience with mindfulness and expressed interest in learning more about mindfulness meditation in the future. In addition, nearly all residents thought mindfulness was an effective stress reduction tool. Despite this interest and belief in efficacy, only a quarter of residents currently use this wellness tool on a regular basis. We believe these results support current efforts to include mindfulness training as one part of the armamentarium against burnout within residency programs. In addition, residents' interest in multiple types of mindfulness as well as a variety of training settings provides guidance to the content and structure of future residency-based mindfulness programs.

References

- Epstein RM. Mindful practice. *JAMA*. 1999;282(9):833-39.
- Sharma M, Rush SE. Mindfulness-based stress reduction as a stress management intervention for healthy individuals: a systematic review. *J Evid Based Complementary Altern Med*. 2014;19(4):271-86.
- Krasner MS, Epstein RM, Beckman H, et al. Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *JAMA*. 2009;302(12):1284-93.
- Goodman MJ, Schorling JB. A mindfulness course decreases burnout and improves well-being among healthcare providers. *Int J Psychiatry Med*. 2012;43(2):119-128.
- Shanafelt TD, Hasan O, Dyrbye LN, et al. Changes in Burnout and Satisfaction With Work-Life Balance in Physicians and the General US Working Population Between 2011 and 2014. *Mayo Clin Proc*. 2015;90(12):1600-13.
- Dyrbye LN, West CP, Satele D, et al. Burnout among U.S. medical students, residents, and early career physicians relative to the general U.S. population. *Acad Med*. 2014;89(3):443-51.
- Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. *Ann Intern Med*. 2002;136(5):358-67.
- Fahrenkopf AM, Sectish TC, Barger LK, et al. Rates of medication errors among depressed and burnt-out residents: prospective cohort study. *BMJ*. 2008;336(7642):488-91.
- Shanafelt TD, West C, Zhao X, et al. Relationship between increased personal well-being and enhanced empathy among internal medicine residents. *J Gen Intern Med*. 2005;20(7):559-64.
- Busireddy KR, Miller JA, Ellison K, Ren V, Qayyum R, and Panda M. Efficacy of interventions to reduce resident physician burnout: A systematic review. *J Grad Med Ed*. 2017; 9(3):294-301.
- Panagioti M, Panagopolou E, Boer P, et al. Controlled interventions to reduce burnout in physicians: a systematic review and meta-analysis. *Jama Intern Med*. 2017;177(2):195-205.
- Jain S, Shapiro SL, Swanick S, et al. A randomized controlled trial of mindfulness meditation versus relaxation training: effects on distress, positive states of mind, rumination, and distraction. *Ann Behav Med*. 2007;33(1):11-21.
- Beach MC, Roter D, Korthuis PT, et al. A multicenter study of physician mindfulness and health care quality. *Ann Fam Med*. 2013;11(5):421-28.
- Goldhagen BE, Kingsolver K, Stinnett SS, Rosdahl JA. Stress and burnout in residents: impact of mindfulness-based resilience training. *Adv Med Educ Pract*. 2015;25(6):525-32.
- Runyon C, Savageau JA, Potts S, Weinreb L. Impact of a family medicine resident wellness curriculum: a feasibility study. *Med Educ Online*. 2016;21. doi:10.3402/meo.v21.30648.
- Zazulak J, Sanaee M, Frolic A, et al. The art of medicine: arts-based training in observation and mindfulness for fostering the empathic response in medical residents. *Med Humanit*. 2017;43(3):192-98.
- Wen L, Sweeney TE, Welton L, Trockel M, Katznelson L. Encouraging Mindfulness in Medical House Staff via Smartphone App: A Pilot Study. *Acad Psychiatry*. 2017;41(5):646-50.
- Ripp JA, Privitera MR, West CP, et al. Well-being in Graduate Medical Education: A Call for Action. *Acad Med*. 2017;92(7):914-17.
- Lavelle C. Mindfulness in Residency: Making a Case for More Research. *Acad Med*. 2017;92(7):902.
- Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap) - A metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42(2):377-81.
- Dickinson J, Berkman ET, Lieberman MD. Neural correlates of focused attention during a brief mindfulness induction. *Soc Cog Affect Neurosci*. 2013;8(1):40-47.
- Zeiden F, Johnson SK, Diamond BJ, David Z, Goolkasian P. Mindfulness meditation improves cognition: evidence of brief mental training. *Conscious Cogn*. 2010;19(2):597-605.
- Cramer H, Hall H, Leach M, et al. Prevalence, patterns and predictors of meditation use among US adults: A nationally representative survey. *Scientific reports*. 2016;10(6):36760.

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Disclaimer

The views expressed within this manuscript are those of the authors and do not necessarily reflect those of Rhode Island Hospital or The Alpert Medical School of Brown University.

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