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**In healthcare providers, what is the effect of mindfulness-based interventions
compared with no mindfulness-based interventions
on stress and burnout in 4 weeks or more?**

By

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Background

High suicide rates and job burnout are associated with the healthcare profession, especially among physicians. The healthcare work environment is characterized by stress, demanding workloads, long shifts, and strong emotions that impact the well-being of healthcare providers (HCPs).¹⁻³ HCPs may experience symptoms of anxiety, stress, depression, and insomnia. The well-being of healthcare providers ultimately affects medical-decision making and quality of patient care.^{1,4-6} Mindfulness practice has been proposed to reduce workplace stress experienced by HCPs.^{1,6} Mindfulness is a form of training in which an individual maintains attention on the unfolding present experience in a non-judgmental way.¹ Practicing mindfulness is believed to promote attention regulation, sense of well-being, and acceptance of emotions and thoughts.¹⁻² Mindfulness-based interventions (MBIs), compared to no intervention, will be explored to ascertain whether they provide beneficial effects on stress and burnout in HCPs, and if so, whether these improvements are durable.

Discussion

Over the past decade, both the interest and the amount of research on MBIs' effects on HCPs have increased. In a systematic review and meta-analysis by Burton et al., examining the effectiveness of MBIs for reducing stress in HCPs, 8 out of 9 studies reported that MBIs have the potential to significantly reduce HCP stress levels.¹ Stress outcomes were measured at immediate follow-up, but long-term impact was not determined.¹ The meta-analysis included a total of 188 participants working in healthcare settings such as nurses, midwives, doctors, and occupational therapists.¹

Another systematic literature review (SLR) by Gilmartin et al., examined the effects of brief mindfulness practices performed by healthcare providers. A totaling of 833 participants working in the hospital setting were examined. Significant improvements following the intervention in provider well-being (including lower levels of stress and anxiety, increased mindfulness and resilience, and diminished burnout symptoms) were found in 9 out of 14 studies in this review.² Nonetheless, while mindfulness

interventions have the potential to reduce HCP stress levels, major barriers to adherence and implementation of MBIs in healthcare settings include time constraints and scheduling.² For those reasons, studies with brief interventions were explored, wherein dose and duration varied and ranged from in-person encounters lasting 5 to 20 minutes per day up to 30 minutes per week over 4 weeks, to online modules lasting 5 to 20 minutes up to 1 hour over 8 weeks, to audio-guided sessions for 8 weeks to smart-phone app interactions lasting 10 minutes per day over 10 days. Lastly, five studies examined MBI in a multifaceted program which included 30 minutes of intervention.² The types of mindfulness practices in the reviewed studies included breathing exercises on increasing awareness, presence, or acceptance, Buddhist Anapanasati breathing meditation, Vipassana meditation, and mindfulness-based stress reduction content. A variety of modalities were implemented such as in-person guided meditation sessions, audio recordings, Headspace smartphone application, online modules, and a combination of lecture, discussion, and group or independent practice sessions.² Interestingly, the results of this review suggested that the type of MBI may be less important than adaptation to provider setting and schedule.² The weaknesses of this meta-analysis were its limited amount of studies and their moderate quality.² Generalizability and reliability of the results were limited by omission of data pertaining to exposure and dose of intervention.² The strength of this SLR was its rigorous study method utilizing a thorough literature search and strong criteria.² Notably, it was the first systematic review to examine the impact of brief MBIs in a healthcare setting.²

Although improvements in psychological symptoms were found in the aforementioned studies, not all research confirmed these findings. One randomized clinical trial (RCT) by West et al., involved an intervention that was employer-provided with protected time designed to promote meaning in work and reduce stress among physicians. Seventy-two practicing physicians from a single academic center participated in a small-group curriculum incorporating elements of mindfulness, reflection, and shared experience for a duration of 9 months.³ No statistically significant differences between the intervention

group and the control group were found, specifically no differences in stress, depression symptoms, overall quality of life, or job satisfaction.³ Rates of depersonalization, emotional exhaustion, and overall burnout, however, were reduced substantially in the intervention arm ($p=.03$), decreased slightly in the control arm ($p=.007$), and increased in the non-trial cohort ($p=.002$).³ While this trial did not support the supposition of MBIs reducing stress levels, its results showed an association of MBIs with a substantial decrease in overall provider burnout. Overall, the evidence was strong in terms of the significance of the findings, the RCT design, and the duration of the study, although the small sample size was limiting.

Two years later, the same researchers West et al., produced the most comprehensive systematic literature review and meta-analysis to date, assessing the effect of mindfulness-based interventions on physician burnout. This investigation analyzed 15 RCTs with 716 physicians and 37 cohort studies with 2914 physicians.⁴ Burnout decreased from 54% to 44% ($p<0.0001$; 14 studies), high emotional exhaustion decreased from 38% to 34% ($p<0.0001$; 21 studies), and high depersonalization decreased from 38% to 34% ($p=0.04$; 16 studies).⁴ Furthermore, both individual-focused and organization-implemented strategies resulted in clinically meaningful reductions in physician burnout per the evidence in these studies.⁴ While this meta-analysis was weak in terms of substantial risk of bias, it was strong because of the large sample size and the statistically similar results among its studies.⁴

In another randomized controlled study by Shapiro et al., assessing 38 clinically active healthcare professionals practicing mindfulness-based stress reduction (MBSR) for 8 weeks, the intervention group demonstrated a significant mean reduction (27% vs. 7%) in perceived stress and decreased job burnout (10% vs. 4%) compared with the control group.⁵ These results reinforced that MBIs have the potential to reduce both stress and burnout in HCPs for at least 4 weeks or more. In addition, evidence was found for an increase in self-compassion (22% vs. 3%), decreased distress (23% vs. 11%), and greater satisfaction with life (19% vs. 0%).⁵ These findings should be interpreted with caution, however, because of the study's small sample size.

In another approach, an RCT by Lebares et al., examined the effects of MBIs on surgery resident performance as well as on stress and burnout over an 8-week period. 21 participants taking the MBSR course had less stress, increased mindfulness, and increased working memory capacity (WMC) compared to the control arm.⁶ Furthermore, in the MBSR participants, neuroimaging showed enhanced activity during emotional regulation of tasks in brain regions associated with executive function control (dorsolateral prefrontal cortex) and self-awareness (precuneus).⁶ Additionally, symptoms of depression in the control group more than doubled compared to those experienced by the MBSR participants. In contrast, burnout scores increased for both the MBSR and control groups, with little difference between these groups.⁶ Although the burnout score did not decrease, the evidence supported the potential benefits of MBIs in well-being and executive function for surgeons-in-training.⁶

Very limited studies are available on how MBIs affect HCP clinical performance, and of those, most are focused on exploring the effects of MBIs on well-being outcomes such as stress, burnout, depression and distress. In a 2018 systematic review by Lomas et al., a total of 3,805 participants from 81 eligible studies were evaluated for the impact of mindfulness on well-being of HCPs.⁷ Findings in 25 of the 37 intervention studies corroborated a significant improvement associated with MBIs, whereas 12 reported no significant changes.⁷ The disparities in the evidence may explain the inconsistencies found among the study designs and sample sizes, for which reason, further research using higher quality RCTs is necessary.

Whether MBIs, compared with no intervention, had a positive effect on stress and burnout in HCPs for 4 weeks or more was examined, in a combination of SLRs, meta-analyses, RCTs, and before-and-after study of participants. Participants in the various studies answered multiple scaled, validated psychometrics such as Maslach Burnout Inventory, Perceived Stress Scale, 9-item Patient Health Questionnaire (PHQ-9), Brief Symptom Inventory, Self-Compassion Scale, and Depression, Anxiety and Stress Scale - 21 (DASS-21).¹⁻¹⁰ These studies used many of the same validated psychometrics, but they were inconsistent because the type and amount varied in each study. In the three systematic literature

reviews investigating stress outcomes, all revealed that over half of their analyzed studies found positive effects of MBIs in stress reduction.^{1,2,7} Five of the six studies that examined burnout reported beneficial effects of MBIs in decreasing burnout symptoms. The one study by Lebares et al., that did not show a decrease in burnout symptoms found little difference between the control and intervention group.⁶ Overall, the SLR studies varied in the quality of their design and evidence. Although, these SLRs offer a large sample size, higher quality randomized control trials are needed.

The evidence in all of the above seven studies that assessed stress outcomes, including the systematic literature reviews (SLRs), confirmed decreases in stress symptoms with MBIs. The SLR by Burton et al., revealed evidence that all forms of MBI, not just MBSR, can be beneficial for reducing HCP stress.¹ Interestingly, evidence in these studies suggested that adjustment to provider setting and time constraints may be more important than the type of MBI practiced. While significant improvements in stress were evidenced, the SLR by Gilmartin et al., showed that none of its studies found an effect on provider behavior.² No significant effects were found on overall HCP quality of life or job satisfaction.³ However, rates of depersonalization, emotional exhaustion, and overall burnout decreased substantially in MBI participants.³

A decrease in burnout associated with MBIs was shown in many of the studies. One SLR by West et al., that included only physician participants found an overall decrease in burnout, as well as reduction in emotional exhaustion and depersonalization. Another SLR by Lomas et al., found equivocal results, 11 studies exhibiting significant improvement and 11 reporting no significant improvement in burnout symptoms.⁷ The review posited that larger sample sizes are necessary to clarify the effect of MBIs on burnout.

Results, strengths, limitations

Many of the systematic literature reviews had a selection of studies with high quality design and evidence. In multiple RCTs, data were obtained using well-validated surveys and tests, with preliminary

evidence that showed outcome measures as sensitive. In addition, quality of the evidence suggested that the study designs can be adequately reproduced in future trials. The major limitations of these studies were that all trial participants were self-selected, sample sizes were modest in many of the trials, and the types of mindfulness interventions were heterogeneous. Several of the studies were conducted at a single institution with small sample sizes. In the pilot study designs, limitations revolved around the lack of a control group and a lack of generalizability because of participant self-selection.

Summary of Findings

In summary, MBIs have significant positive effects on stress among HCPs. Notably, the results overall suggest that the type of MBI may be less important than its adaptation to HCP setting and schedule. Finally, a substantial decrease in overall job burnout can be seen with mindfulness-based interventions. Despite these findings, new questions arise from gaps in knowledge. What are the long-term impacts of MBIs on stress and burnout? What type of MBI would have the greatest effect on reducing stress and job burnout? What is the impact of MBIs on patient-reported satisfaction with HCP or quality of care?

Conclusion

In healthcare providers, practicing MBIs compared to not incorporating MBIs produced significant reductions in the occurrence of stress symptoms and burnout that lasted 4 weeks or more. The implications of this evidence are that among HCPs, practicing MBIs can achieve clinically meaningful reductions in burnout and stress. Given that evidence, MBIs have the potential to positively affect the quality of patient care. However, more good quality studies are necessary to support these associations. Future areas of investigation include examining which interventions are most effective in stress and burnout reduction and in improving well-being across its many dimensions. Larger and longer duration studies are needed to assess not only the impact on clinical care, but also long-term changes in HCP

well-being. Further research into individual and organizational solutions can be combined to determine optimal implementation of MBIs. Discovering the optimal delivery and types of MBIs are relevant to improving HCP well-being through stress and burnout reduction. These findings have the potential to change clinical practice as burnout and distress have been significantly associated with decreased patient satisfaction.^{1,2,4}

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