

Original Research

Sustained resiliency building and burnout reduction for healthcare professionals via organizational sponsored mindfulness programming

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ABSTRACT

Purpose: To measure healthcare professional (HCP) result sustainability following implementation of an organizationally sponsored Mindfulness Based Intervention (MBI), Mindfulness in Motion (MIM), in areas of burnout, perceived stress, resilience, and work engagement.

Methods: A follow-up survey was sent via email to healthcare professionals ($n = 220$) who previously participated in the 8-week MIM intervention. Survey assessed burnout, perceived stress, resilience, work engagement, and included open-ended questions pertaining to barriers, facilitators, and sustained impact of practicing mindfulness after program end.

Results: Analysis included 66 healthcare professionals with sustainability time frames ranging from 3 to 28 months from initial program finish. Average time since intervention end was 12.2 months. Based on 12.2 months sustained results post MIM, there were significant differences from pre-MIM to sustainability follow-up in burnout ($*p = 0.0047$), perceived stress ($*p = 0.00001$), and resilience ($*p = 0.0004$). Work engagement benefits were non-significant from pre-test to follow-up ($p = 0.4008$). There were no significant differences in results when comparing the length of time since participant was enrolled in the initial study. Additionally, analysis of the qualitative data revealed multiple subthemes relating to facilitators of sustained mindfulness, barriers to practicing mindfulness, and lasting impacts of the MIM intervention.

Conclusions: For Healthcare Professionals, the organizationally sponsored mindfulness intervention outcomes were sustained beyond the 8-weeks of the initial MIM intervention for all but one outcome variable. Post 8-week intervention end, participants were given the option of receiving weekly “Mindful Moment” emails and attending monthly mindfulness booster sessions. Organizational support may be a pivotal factor in sustaining positive results achieved via mindfulness programming.

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Introduction

It is well known that healthcare professionals (HCPs) experience a high level of workplace stress and that levels of burnout are disproportionately high when compared with other professions.¹ On August 13, 2020, the Association of American Medical College (AAMC) endorsed legislation to establish programs addressing suicide, burnout, and mental health among healthcare professionals indicating the need for workplace interventions to reduce burnout and increase resilience.² They recognized the sources of stress that can cause burnout and how “stigma, bias, and other barriers can hinder health professionals from seeking and receiving care for new or

ongoing mental and behavioral health challenges”.² Research has shown a negative correlation between how empathic a provider can be in the delivery of health care, and the level of burnout the provider is experiencing.³ When HCPs experience high levels of stress and burnout, it inhibits their ability to provide effective patient care and empathy. In light the current COVID-19 pandemic, researchers have seen an even greater need for interventions to address burnout and boost mental health in healthcare professionals.⁴ With institutional support, Mindfulness-Based Interventions (MBIs) can provide both pragmatic and potentially sustainable results to mitigate both the psychological and physiological costs that HCPs encounter during and after a pandemic.

Evidenced based research shows that MBIs have been effective in reducing negative stress-related health outcomes within health systems for HCPs.^{5,6} A recent systematic review revealed that MBIs can mitigate the effects of stress and improve the psychological health

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outcomes of HCPs with shortened MBIs,⁷ that are based upon the traditional Mindfulness-Based Stress Reduction (MBSR)⁸ found to be as effective as the traditional MBSR for HCPs.⁷ Mindfulness in Motion (MIM) is an example of one such MBI, utilized to improve resiliency for HCPs. MIM is a pragmatic MBI developed by the first author to be delivered during work time, that includes mindfulness, gentle yoga, community building and relaxing music.⁹ By promoting nonjudgmental awareness of the present-moment and acceptance of feelings, thoughts, and sensations, MIM gives the HCP an increased ability to respond to stressful events, as evidenced by reductions in sympathetic nervous system activation.¹⁰ We have previously shown that MIM, an 8-week weekly one-hour group mindfulness training at work, can reduce biological and behavioral markers of reactivity to stress and indexes of burnout among HCPs.^{10–13} The MIM protocol has been described in detail,⁹ with significant changes pre/post after the 8-week program in burnout, perceived stress, work engagement and resilience.¹¹

MIM is conducted in small group settings that encourage discussion and conversation. This allows for a sense of community to be fostered throughout the program with the hope that it can translate into a work environment. Learning about mindfulness and self-awareness in a group setting is a highly useful experience for those working in high stress environments such as medical centers, and has shown positive results across studies.¹ The gap in the literature concerns the sustainability of results. A critical barrier exists within the scientific literature regarding the sustainability of health behavior change and the gap is even greater regarding evidence that mindfulness produces long term benefits.^{14, 15}

There is some limited research on long-term sustainability of results after a typical 8-week MBSR intervention. Mindfulness can have a positive impact on the health-related and work-related quality of life for healthcare professionals that continues to persist 12 months post-program.¹⁶ Recent research has also investigated the facilitators and barriers to sustaining mindfulness. For individuals, the main barriers included lengthy practices, negative thoughts, and self-criticism; while shorter practices, the need for stress reduction, and increased sense of control over thoughts were identified as main facilitators.¹⁷

Beyond the individual, there is much that organizations can do to limit barriers and facilitate mindfulness in the workplace to increase its integration and the sustainability of outcomes. When organizations recognize the need for and implement both proactive and preventative methods across the entire organization, mentally healthy workplaces can be established and fostered.¹⁸ When organizations invest in healthcare employees' wellness, potential benefits include "increased perceived support, reduced barriers to help seeking and possible reductions in sickness absence".¹⁸

The purpose of this study was to 1) determine sustainability of the quantitative and qualitative benefits of the 8-week MIM intervention, and 2) determine any facilitators or barriers that participants may deem as important to sustaining positive results obtained from the initial MIM 8-week program.

Methods

Participants

A follow-up survey was sent to previous MIM participants who were still working at OSUWMC in an effort to assess the sustained effects of the program. Participants were eligible to participate in the study if they: 1) were a previous participant within the MIM program; 2) had complete pre and post intervention data; 3) were a current employee at OSUWMC; and 4) were able to access their work email. The follow-up survey was sent late February 2020 and closed early March 2020. Study approval (study number 2017B0321) was

obtained by an Institutional Review Board responsible for human subjects' research at The Ohio State University.

The follow-up study was distributed via REDCap to eligible participants ($n = 220$) with informed consent embedded within the email. The survey took approximately 10 min, and participation was voluntary. Of the 220 eligible participants, 77 completed the follow-up survey (35% response rate). Of these 77 participants, 11 were excluded due to incomplete survey responses. Therefore, the sample size for this analysis was 66. Once the surveys were collected, all information was de-identified to remain confidential. Only the necessary study personnel had access to identifiable information to ensure completion of the record. All data was de-identified before analysis and was not included in any public documents.

Intervention: mindfulness in motion program

The Mindfulness in Motion (MIM) program is a Mindfulness Based Intervention (MBI) sponsored by the Gabbe Health and Wellness Initiative through The Ohio State University Wexner Medical Center. It is offered as a modified and less time intensive method for healthcare professionals (HCPs) to experience the benefits of mindfulness. It is an 8-week program with one-hour group session weekly. During each session, mindful awareness principles are taught, mindfulness is rehearsed as a group, the use of gentle yoga stretches are emphasized, and relaxing music is played in the background of both the group sessions and individual mindfulness practice. Audio and videos are provided to supplement the one-hour sessions to facilitate individual practice within the password protected website mindfulnessinmotion.osu.edu. After completion of MIM and beyond the 8-week program, participants no longer have access to the website materials but can attend monthly boosters at the worksite and opt to receive weekly mindfulness emails. To assess the sustainability and impact of the MIM program in participants' everyday life, a follow-up survey was administered to obtain participant responses to the same survey instruments that were administered pre/post the initial 8-week intervention.

Measures

Information was collected about participant characteristics (age, gender, ethnicity, and race) by connecting participant information to previous MIM pre and post data. In alignment with previously collected pre and post data, the researchers used the following measures to assess burnout, perceived stress, resilience, and work engagement:

Maslach burnout inventory (MBI)

The MBI-Human Services Survey contains 22 items measuring three elements of burnout: emotional exhaustion, depersonalization, and sense of personal accomplishment, on a 0 to 6 scale. Cronbach's α was 0.90 for Emotional Exhaustion, 0.79 for Depersonalization, and 0.71 for Personal Accomplishment.¹⁹ Burnout was defined as meeting the following criteria on one or more subscales: score ≥ 27 on emotional exhaustion subscale, score ≥ 13 on depersonalization subscale, score ≤ 31 on the personal accomplishment subscale.²⁰

Perceived stress scale (PSS)

The 10-item PSS is a reliable measure of the degree to which situations are perceived as stressful on a 5-point scale during the last month.²¹ Cronbach's α was 0.90 for this scale.

Connor–Davidson resilience scale (CD-RISC)

Resilience corresponds to the ability to maintain good functioning in face of stress or trauma. CD-RISC scores have been shown to increase after treatments designed to improve resilience.²² The 10-items version of the CD-RISC has been validated with good reliability

(alpha value of 0.85) and validity to differentiate individuals functioning well after adversity from those who are not.³⁷

Utrecht work engagement scale (UWES)

The UWES has 9 statements on a scale from 0 to 6, with a total score and three subscales for vigor, dedication, and absorption.²³ Internal consistency of the scale was demonstrated with Cronbach's α of 0.92 for the total score, 0.86 for vigor, 0.86 for dedication, and 0.79 for absorption subscales.

Open-ended questions

The follow-up survey incorporated open-ended questions to identify barriers ("What are some things that make incorporating mindfulness into your life more difficult for you?"), facilitators ("What are some things that make incorporating mindfulness into your life easier for you?"), impact ("How has mindfulness specifically impacted your work/personal life?"), and sustainability of the MIM program ("Following your participation in Mindfulness in Motion, how do you feel that you have incorporated mindfulness into your life?").

Data analysis

Descriptive statistics were used to summarize demographic characteristics. Due to variability within participant time from MIM program completion, time period groups were determined after consulting the current literature and ensuring adequate sample size within each group.^{14,15} Chi-square analysis was conducted to assess differences in demographics (gender, ethnicity, and race) between those at 0–6 months, 7–12 months, and 13–28 months post initial 8-week intervention. One-way ANOVA was used to assess differences in age between the three follow-up periods.

Repeated measures t-tests were conducted to determine significant changes in perceived stress, resilience, and work engagement between follow-up time point and pre and post data from the original MIM intervention. Chi-square analysis was conducted to assess differences in the percentage of healthcare professionals that met the criteria for burnout across the three follow-up periods. Fisher's exact test was used in instances of low cell count. Statistical significance was determined by a p-value less than 0.05. All quantitative analyses were conducted by the study research coordinator as a precaution to reduce confirmatory bias, using the Stata/SE 16 statistical analysis software.

The follow-up survey open-ended questions were analyzed using the NVivo12 qualitative analysis software. The researchers used a semi-structured analysis approach to organize and analyze potential themes from the open-ended questions within the follow-up survey. Two different researchers coded potential themes independently, and discrepancies were reviewed by the entire research team.

Results

Participant characteristics

The average age of survey respondents was 41.02 years old with a standard deviation (SD) of 11.48. The majority were female (83%), Non-Hispanic (95%), and Caucasian (88%) (Table 1). The average period of time between completion of post-intervention survey and completion of follow-up survey was 12.2 months. Participants were divided into time period groups of 0–6 months ($n = 17$), 7–12 months ($n = 25$), and 13–28 months ($n = 24$) in order to assess length of sustained results. There were no statistically significant differences in participant characteristics (age, gender, ethnicity, and race) across follow-up groups.

In addition, the distribution of healthcare professional roles among the survey sample ($n = 66$) was similar to distribution among the original MIM participants ($n = 220$) (Fig. 1).

Quantitative assessment of outcome measures at follow-up

The results of the study indicate sustained benefits in burnout, perceived stress, and resiliency beyond the MIM 8-week intervention for the total healthcare professionals ($n = 66$) (Fig. 2).

Burnout

There was a statistically significant decrease in the percentage of total surveyed healthcare professionals ($n = 66$) that met criteria for burnout from pre-test (48%) to follow-up (30%) ($p = 0.0047$). Furthermore, the change in burnout from original post-test (26%) to follow-up (30%) was not statistically significant ($p = 0.1849$). Healthcare professionals surveyed at 0–6 months ($n = 17$) were the only follow-up period to sustain a statistically significant decrease in burnout when comparing pre-test (53%) to follow-up (24%) ($p = 0.0279$).

Perceived stress

There was a statistically significant decrease in the mean perceived stress score when comparing the total surveyed healthcare professionals ($n = 66$) from pre-test (15.32; SD= 5.93) to follow-up (12.48; SD= 5.36) ($*p = 0.0001$). The change in perceived stress from original post-test (11.41; SD=6.13) to follow-up was not statistically significant ($p = 0.0533$). Healthcare professionals surveyed at 13–28 months ($n = 24$) were the only follow-up period to sustain a statistically significant decrease in perceived stress when comparing pre-test (15.83; SD= 6.75) to follow-up (11.75; SD=5.16) ($p = 0.0007$).

Resilience

There was a statistically significant increase in mean resilience score when comparing the total surveyed healthcare professional ($n = 66$) from pre-test (29.88; SD= 5.32) to follow-up (31.89; SD=5.10) ($p = 0.0004$). The change in resilience from original post-test (32.70; SD= 4.77) to follow-up was non-significant ($p = 0.0537$). Healthcare professionals surveyed at 0–6 months ($n = 17$) sustained a statistically significant increase in resilience when comparing pre-test (30.24; SD=5.41) to follow-up (32.71; SD =3.60) ($p = 0.0313$). Additionally, healthcare professionals surveyed at 7–12 months ($n = 25$) sustained a statistically significant increase in resilience when comparing pre-test (28.80; SD=4.73) to follow-up (31.36; SD= 5.04) ($p = 0.0041$).

Work engagement

There was no statistically significant increase in mean work engagement scores when comparing the total surveyed healthcare professional ($n = 66$) from pre-test (4.46; SD=0.91) to follow-up (4.48; SD=0.96) ($p = 0.4008$). There was a statistically significant decrease within work engagement when comparing post-test (4.75; SD=0.77) to follow-up ($p = 0.0012$). There were no statistically significant changes in work engagement when comparing pre-test to follow-up across any of the time periods.

Regarding differences between time groups, there were no statistically significant differences when comparing follow-up outcome measures (burnout, perceived stress, resilience, and work engagement) across the various time points (Table 2).

Open-ended questions

Based on participant responses to the open-ended questions, multiple themes and subthemes were identified relating to barriers to practicing mindfulness, facilitators of sustained mindfulness, and lasting impacts of the mindfulness intervention (Table 3). Common facilitators identified from the participants' responses included

Table 1
Demographic characteristics among MIM participants who completed the follow-up survey (n = 66) by time post-MIM.

MIM Follow Up Survey (n = 66)				
Variable*	0–6 Months Post-MIM (n = 17) (26%)	7–12 Months Post-MIM (n = 25) (38%)	13–28 Months Post-MIM (n = 24) (36%)	Total# (n = 66) (100%)
Age‡ (average years, SDⓂ)	42.29 (10.18)	39.00 (11.38)	42.26 (12.61)	41.02 (11.48)
Gender				
Male	3 (18%)	3 (12%)	5 (21%)	11 (17%)
Female	14 (82%)	22 (88%)	19 (79%)	55 (83%)
Ethnicity				
Hispanic	0 (0%)	0 (0%)	3 (12%)	3 (5%)
Non-Hispanic	17 (100%)	25 (100%)	21 (88%)	63 (95%)
Race				
Caucasian	15 (88%)	23 (92%)	20 (83%)	58 (88%)
African American	1 (6%)	1 (4%)	0 (0%)	2 (3%)
Other	1 (6%)	1 (4%)	4 (17%)	6 (9%)

‡Sample sizes may be less than total due to missing data.

*All variables have non-significant p-values ($p > 0.05$) for comparisons between 0 and 6 months, 7–12 months, and 13–28 months.

#Average time for follow-up for total is 12.2 months.

ⓂSD= Standard Deviation.

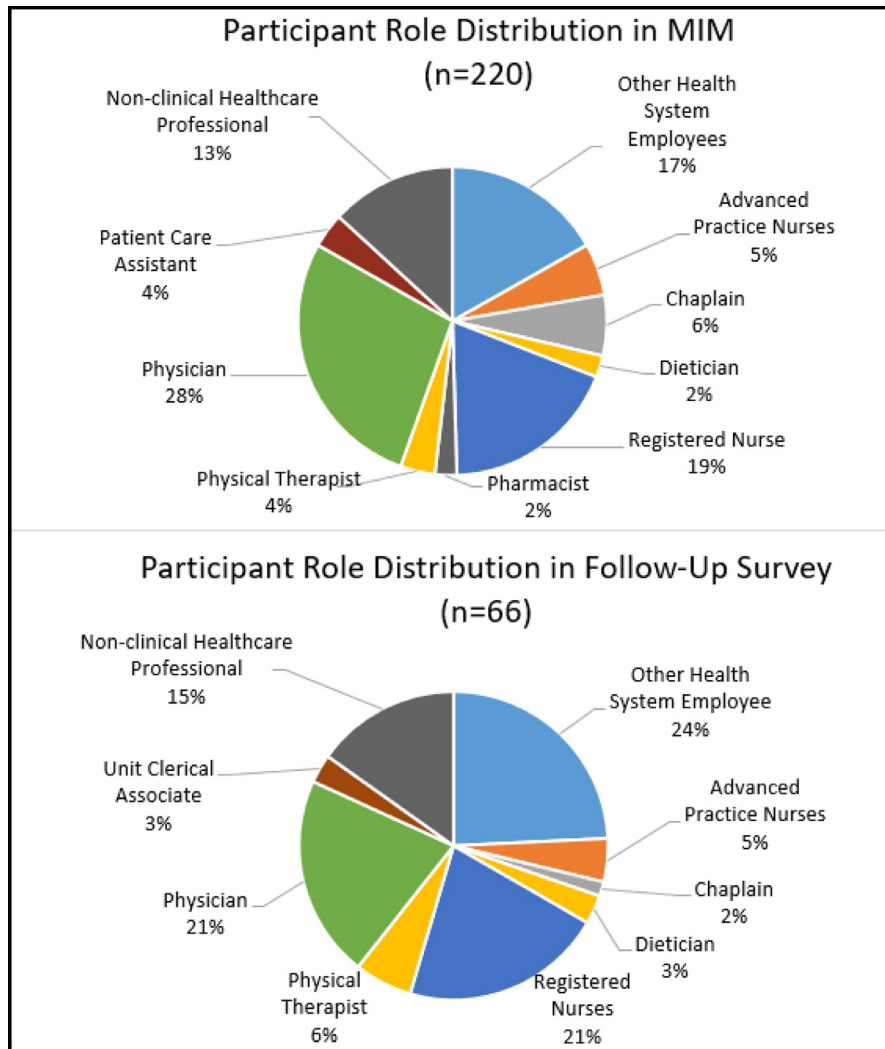


Fig. 1. Participant role distribution.

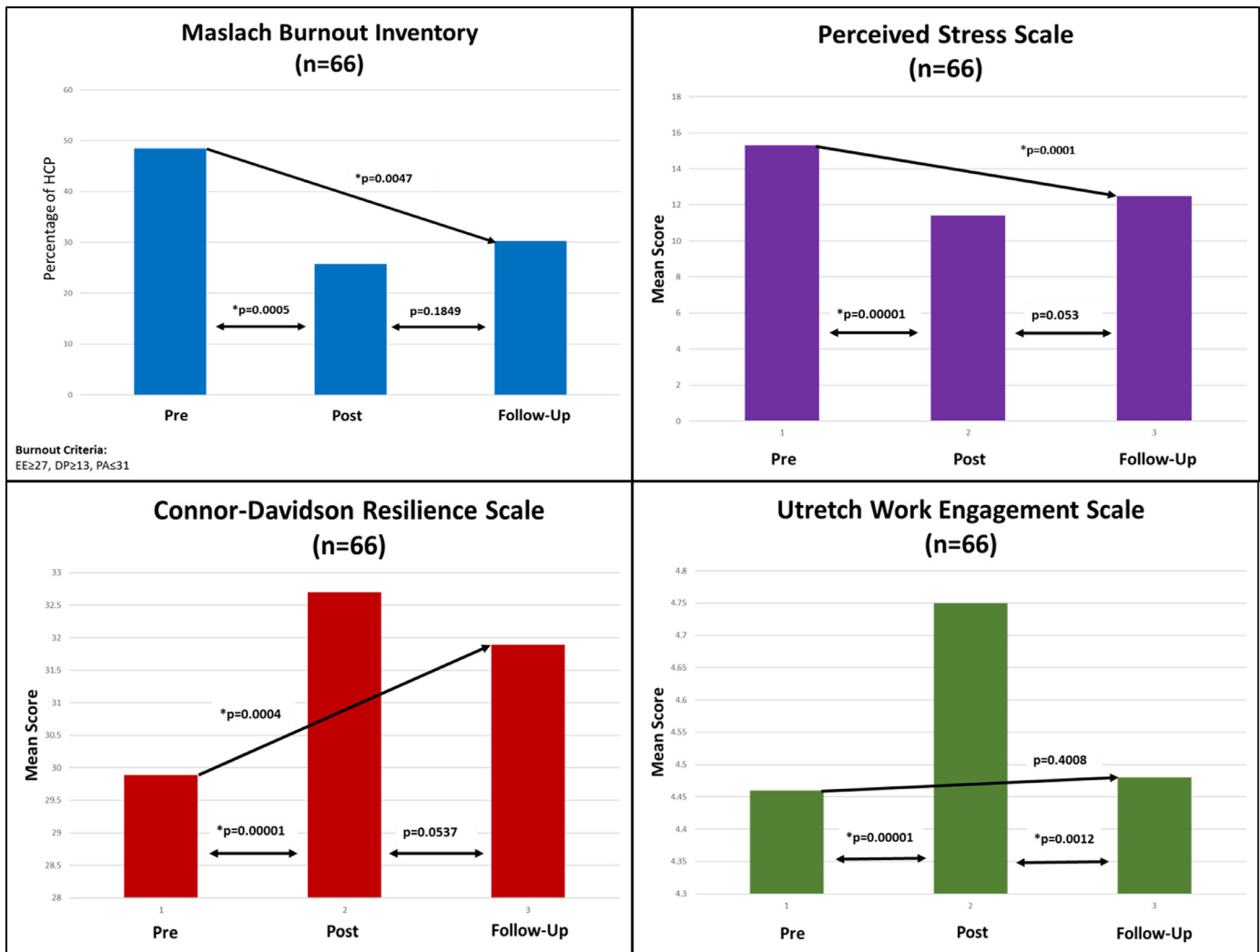


Fig. 2. Sustained effects of the benefits of MIM pertaining to burnout, perceived stress, resilience, and work engagement within healthcare professionals at follow-up, 12.2 average months post intervention ($n = 66$).

organizational support, cues/reminders, and habit/schedule/routine. For the participants, these facilitators contributed to the successful implementation of mindfulness practices and sustained benefits. Common barriers identified included organization demands, time constraints, and personal barriers. These barriers made practicing mindfulness more difficult thus limiting opportunities to benefit from it. Sustained impacts of mindfulness identified through qualitative analysis of the responses included improvements in the following areas: emotional clarity, stress management, perspective taking, relationships, and work/home separation (Table 3).

Discussion

This is the first paper to report the sustained effects beyond the 8-week Mindfulness in Motion (MIM) program shown to improve burnout, perceived stress, resilience, and work engagement for HCPs.^{9–12} Sustainability research is critical to understanding healthcare professional's ability to successfully continue to integrate mindfulness practice within an occupational context. Despite numerous studies, and a recent systematic review⁷ supporting the positive effects of mindfulness for healthcare professionals, there is a significant gap within the current literature pertaining to the sustainability of these results.^{24–26} This study details the sustained impact beyond the original 8-week MIM program for interprofessional HCPs.

In previous studies, MIM participants reported significant improvements in burnout, perceived stress, resilience, and work engagement when comparing baseline to the end of the 8-week program.²⁹ These results align with the current literature as MBIs are effective in improving the psychological health of HCPs when comparing pre and post data.^{5–8} However, the current literature regarding the sustainability of MBI benefits is limited as follow-up assessments are commonly conducted within 12 months, if at all.^{14–16} The current study is significant as surveyed HCPs were able to sustain significant improvements within burnout, perceived stress, and resilience when comparing the total sample of healthcare professionals to their original pre-test data, with follow-up ranging from 0 to 28 months. This study illustrates the potential for MBIs to have sustaining benefits within occupational settings, especially if they are pragmatically designed for a specific workplace, such as a health system.

Participants within this study were predominately Non-Hispanic (95%), white (88%), female (83%), and an average age of 41.02 (± 11.48). Although the participant demographic characteristic within this study are relatively homogeneous, the participants are representative of the larger MIM sample.¹⁰ Homogeneity within mindfulness studies is common within the literature due to demographic differences associated with self-selection and cultural acceptance of mindfulness programming.²⁷ Mindfulness interventions are underutilized in African American communities despite their promise of potential positive impact, which is unfortunate as these communities often

Table 2
Sustained benefits of MIM within healthcare professionals pertaining to burnout, perceived stress, resilience, and work engagement by follow-up time periods of 0–6, 7–12, and 13–28 months. (n = 66).

Burnout (Maslach Burnout Inventory) % meeting burnout criteria				
	0–6 months (n = 17)	7–12 months (n = 25)	13–28 months (n = 24)	Total (n = 66)
Pre-test	53%	48%	46%	48%
Post-test	24%	28%	25%	26%
Follow-up	24%*	32%	33%	30%**
Perceived Stress (Perceived Stress Scale) Mean (SD) [‡]				
	0–6 months (n = 17)	7–12 months (n = 25)	13–28 months (n = 24)	Total (n = 66)
Pre-test	16.06 (5.27)	14.32 (5.60)	15.83 (6.75)	15.32 (5.93)
Post-test	14.06 (6.93)	9.56 (5.12)	11.46 (6.05)	11.41 (6.13)
Follow-up	13.71 (5.52)	12.36 (5.51)†	11.75 (5.16)**	12.48 (5.36)*
Resilience (Connor Davidson Resilience Scale) Mean (SD)				
	0–6 months (n = 17)	7–12 months (n = 25)	13–28 months (n = 24)	Total (n = 66)
Pre-test	30.24 (5.41)	28.80 (4.73)	30.75 (5.86)	29.88 (5.32)
Post-test	31.29(3.72)	33.72 (4.34)	32.63 (5.71)	32.70 (4.77)
Follow-up	32.71 (3.60)*†	31.36 (5.04)**††	31.88 (6.10)	31.89 (5.10)**
Work Engagement (Utretch Work Engagement Scale) Mean (SD)				
	0–6 months (n = 17)	7–12 months (n = 25)	13–28 months (n = 24)	Total (n = 66)
Pre-test	4.58 (0.81)	4.49 (0.96)	4.33 (0.96)	4.46 (0.91)
Post-test	4.79 (0.63)	4.76 (0.84)	4.72 (0.83)	4.75 (0.77)
Follow-up	4.76 (0.76)	4.44 (1.09)†	4.32 (0.95)††	4.48 (0.96)††

* p<0.05 comparing pre-test to follow-up.
 ** p<0.01 comparing pre-test to follow-up.
 † p<0.05 comparing post-test to follow-up.
 †† p<0.01 comparing post-test to follow-up.
 ‡SD= Standard Deviation.

face high levels of chronic physiological stress. This low representation could be due to various cultural differences including limited opportunities to participate, and medical mistrust of both HCPs and clinical research.²⁸ Future research should examine ways to increase cultural responsiveness of mindfulness-based interventions, including MIM.

Positive gains made in resilience, with decreases in burnout and perceived stress were significantly different than pre–test measures even at 12.2 months follow-up beyond the original intervention end. This is a substantial finding in and of itself, as the research team conducted the study to ensure that participants did not return to pre-test levels. Our interest was to explore whether or not the

Table 3
Qualitative analysis of open-ended questions pertaining to the facilitators, barriers, and sustained benefits of mindfulness practice within healthcare professionals (n = 66).

Themes	Sub-themes	Representative Participant Response
Facilitators of Mindfulness Practice	Organizational Support	"My residency program makes mindfulness a priority and incorporates it into our didactics, which has been so helpful."
	Cues and Reminders	"I think having an interrupter such as an email or refresher helps me better schedule it into my day with purpose."
	Personal Habituation	"Actually scheduling it into my day instead of accessing mindful tools when I need them (i.e. more reactive vs. proactive/preventative)."
Barriers to Mindfulness Practice	Organizational Demands	"I often hesitate to take time out during the day for mindfulness because I feel a lot of pressure to keep working (mainly from myself, but also deadlines)."
	Time	"Lack of time, and sometimes just forgetting. That's why the weekly emails are a nice reminder to keep being mindful. It's something we need to practice."
	Individual Mentality	"Honestly just having the frame of mind to think about wanting to do it more than anything else."
Sustained Impact of Mindfulness Practice	Emotion Regulation Flexibility	"Focusing on not letting the uncontrollable take over my emotions and moving with change at work and at home."
	Performance within Stressful Environments	"Although doing a meditation exercise is not a guaranteed 'cure all,' every time I take the time to do it, it decreases my overall stress and helps me to respond better to high stress events or environments."
	Perspective	"It also gives me perspective so that I can think of things from a different lens and that usually leads to better decision making."
	Relationships Balance	"Increased presence with my husband and daughter, with my family and friends." "It always surprises me to take time to be present and notice my surroundings increases my peace of mind and allows me to become more balanced in my life and mood."
	Workplace	"Doing this always helps with feelings of being overwhelmed, stressed, or emotionally exhausted at work."

organizationally sponsored mindfulness opportunities offered beyond program end were adequate to sustain some of the positive gains achieved. Researchers hypothesized that the weekly email reminders and the monthly booster sessions would be correlated with greater gains in outcome measures of interest. This hypothesis was not supported by the data in terms of attending booster sessions. It may be that organizational offerings such as these were a signal to the employees that their wellbeing was valued, whether or not they choose to engage in them. Regarding participants reading weekly emails, of the 66 participants that completed the sustainability survey, 60 of them responded that they read them regularly. Based on the small sample size of individuals who did not regularly read emails ($n = 6$), statistical comparisons between those who regularly read emails and those who did not were limited. Further studies will explore in greater depth the impact on specific organizational offerings to extend the benefits of MIM. It may be that weekly touch points are more effective than monthly mindfulness refreshers, or it may have been the fact that participants could read the emails on their own schedule that was the pivotal factor. To address this, we are now recording, and sending out the recordings of the monthly refreshers for those who may want to participate asynchronously. Future MIM sustainability studies will query if participant sustained activity was synchronous or asynchronous, weekly, monthly, or both, to future understand the needs of sustaining gains beyond initial mindfulness programming. Regardless, it is noteworthy that an average of 12.2 months beyond program end that significant changes were still evident compared to participant pre-test scores on resilience, perceived stress, and burnout.

When comparing the individual follow-up periods (0–6, 7–12, and 13–28 months) to pre-test, the sustained results were mixed (changes in outcomes of interest varied in size across follow-up periods, see Table 2) yet changes in outcomes of interest (burnout, stress, resilience, and work engagement) were not significantly different across individual follow-up periods. Potential differences in statistical significance when comparing pre-test to individual follow-up periods may be explained by differences within pre-test scores. This provides evidence to support that insignificant effects regarding sustained benefits may be attributed to inadequate sample versus length of follow-up. Future research should incorporate a larger sample size within each follow-up period to appropriately assess the sustained benefits across individual follow-up periods.

Interestingly, the original positive effect in work engagement was not sustained when comparing all participants to baseline. The integration of mindfulness practice into a daily routine is essential for sustaining the benefits of mindfulness.³⁰ Burnout, perceived stress, and resilience are all potential benefits from practicing mindfulness within a variety of contexts (home, during travel, before/after work, etc.); however, work engagement may require individuals to integrate mindfulness practice within the occupational context, or have others to share their intention to be mindful at work in order to continue the community of support, such as was present during the initial 8-week MIM intervention. It may be that potential barriers within a complex work environment require a community of support to yield sustained positive gains in work engagement. The 8-week MIM program provides a strong sense of community as participants share challenges and successes, while encouraging each other to regularly practice mindfulness. This sense of community and perceived social belonging needs to be fostered within an occupational context to aide in the sustainability of work engagement program results. Therefore, further investigation is necessary to critically investigate the participants' ability to integrate mindfulness into their occupational routine, and the perceived sense of community and social support within the larger healthcare organization.

The follow-up survey incorporated open-ended questions to assess a participant's facilitators, barriers, and sustained benefits

associated with mindfulness practice. Qualitative data was analyzed thematically to investigate emerging themes. Reported facilitators of mindfulness practice included organizational support, regular cues/reminders, and personal habits to practice mindfulness. Reported barriers of mindfulness practice included organizational demands, time constraints, and a proper mindset to prioritize mindfulness. Aspects of the healthcare organization were identified as both facilitators and barriers to integrating mindfulness practice into participants' occupational routine, affirming the importance of the role that the organization plays. Seeing that employee well-being is reflective of organizational success, it is crucial for healthcare organizations to invest in employee wellness by promoting facilitators and mitigating barriers, whenever possible.

The follow-up survey also asked about sustained benefits of mindfulness practice after the completion of MIM. Participants reported improvements in emotional clarity, performance within stressful environments, perspective/decision-making, relationships, and work/home balance. These reported benefits are essential for optimizing healthcare professionals' health and performance as they must provide empathic and quality care within high stress environments. Research on burnout suggests that sustaining the previously reported benefits of mindfulness may serve as an effective prevention strategy that is worth the financial investment made by the organization in providing mindfulness programming for HCPs.^{1,31}

Sustainability of health promotion programs is complex due to the challenge of translating and maintaining program benefits within the original occupational environment.^{32,33} Previous research has identified essential organizational characteristics to increase the sustainability of health promotion programs.³⁴ Characteristics include organizational support, cultural responsiveness, leadership/champions, and routinization of the intended behavior.³⁴ This emphasizes the importance of creating a social and cultural environment that encourages the integration of the target behavior into the occupational routine. This concept is best illustrated by the Bronfenbrenner's Socio-Ecological Model (SEM) which emphasizes the need for multi-level interventions to promote and sustain behavior change.³⁵ Therefore, it is essential for healthcare organizations to implement multi-level strategies that promote regular mindfulness practice within healthcare professionals across the individual (routinization), interpersonal (leadership/champions), and organizational (resources/culture) levels.

Future research should aim to assess the organizational capacity to successfully sustain the benefits of mindfulness programming such as MIM. Based upon the positive results reported here, recommended strategies include weekly mindful moment emails, mindfulness boosters, integration into training curriculum, and encouraging regular mindfulness practice within an occupational routine and the health system at large. This will help support an environment that can sustain positive psychological health benefits produced by mindfulness programming for HCPs.

Limitations

The participants who completed the follow-up survey may reflect response bias as those who were experiencing benefits from the mindfulness intervention may be more likely to complete the survey. Of the 220 participants that were eligible to complete the survey, 66 responded limiting the generalizability of the survey results. In addition, the sample is relatively homogeneous based on demographics, so generalizability of results may be further limited. Based on variability within follow-up times ranging from 0 to 28 months, the participants were grouped into three different follow up periods for analysis. This resulted in a relatively small sample size for each follow-up period which directly effects comparisons within each time point.

Conclusion

This study provides evidence of the sustained benefits of improving burnout, perceived stress, and resilience within healthcare professionals after the completion of the 8-week MIM program in a healthcare system that supported continued mindfulness touch points for the participants. After the completion of the program, participants were given the option of receiving weekly “Mindful Moment” emails and attending monthly booster sessions. This suggests organizational support may be a pivotal factor in sustaining positive results achieved via mindfulness programming, and perhaps more important, that sustaining the benefits garnered by mindfulness programming is indeed possible.

Declaration of Competing Interest

None.

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