Mindful Mentors: Is a Longitudinal Mind–Body Skills Training Pilot Program Feasible for Pediatric Cardiology Staff?

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Abstract

Background: Stress and burnout among medical professionals are common and costly, placing professionals, organizations, and patients at risk.

Objectives: To determine feasibility and acceptability of a longitudinal mind–body skills training initiative to help staff decrease stress and burnout, improve well-being, and empower them to utilize basic mindfulness methods with coworkers, patients, and families.

Methods: Prospective cohort, mixed methods approach. Nurses, doctors, technicians, social workers, child life specialists were eligible to participate. The 12-month curriculum consisted of 16 hours of intensive education/practice over 2 days, with training in mindfulness skills, self-compassion, nonviolent communication, overcoming barriers to practice, and mindful listening/speaking, followed by monthly 1 hour booster/debriefing sessions.

Results: A total of 37 staff participated (RN = 18, MD = 5, Technician = 6, Social Worker = 3, Child life = 3, others = 2) in the initial training, and 24 (65%) completed the 3- and 12-month follow-up surveys. Compared with pretraining scores, there were significant improvements 3 to 12 months after the initial training in stress (P < .0001), distress (P < .04), anxiety (P = .01), self-efficacy in providing non-drug therapies (P < .0001), mindfulness (P = .002), burnout (P < .0001), and confidence in providing compassionate care (P < .0001). In addition, 25 (67%) participants initiated projects incorporating what they learned into staff/patient wellness activities.

Conclusion: This longitudinal pilot program was feasible and was associated with improvements in measures of psychological well-being over the 12-month intervention. The innovative approach of training participants to teach basic techniques to coworkers and other staff can increase the impact of this program beyond any individual participant. Future research will investigate the aspects of implementation and potential effects on patient care and experience.

Keywords

mindfulness, clinicians, stress, pediatric cardiology, well-being, compassion, burnout, anxiety

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**Introduction**

Stress and burnout among medical professionals are common and costly, placing professionals, organizations, and patients at risk. Rates of physician burnout in the United States currently average around 50% with these rates increasing approximately 10% between 2011 and 2014, even as the rates of burnout among the general workforce remained steady.\(^1\)\(^-\)\(^3\) Similarly concerning results have been found for nurses with burnout rates between 34% and 70%.\(^5\)\(^,\)\(^5\) Workplace stress is associated with decreased psychological health, quality of care, and patient satisfaction.\(^6\)

Current organizational strategies to address well-being, stress, and burnout in health-care providers are varied in scope (e.g., sole focus on individual mindfulness vs broader scope of health behavior, communication, social support, or organizational change), type of intervention (e.g., individual, group, and online), and outcome measures.\(^7\) Disagreement exists about which approach best serves the needs of all involved.\(^8\)

Mindfulness is an intentional awareness that allows one to approach experiences in the present moment in a nonjudgmental, nonreactive way that helps to cultivate clear thinking, equanimity, compassion, and open-heartedness.\(^9\) The goal of increasing mindfulness is to maintain an ongoing awareness that creates an improved sense of well-being and emotional balance.

One of the most hopeful interventions to date for clinicians has been mindfulness-based stress reduction (MBSR), which has proven effective in producing significant decreases in stress and anxiety, increases in mindfulness and meaningfulness, and enhanced patient’s perceptions of patient-centered clinical care.\(^10\)\(^,\)\(^11\) MBSR is an evidence-based psychoeducational intervention that incorporates meditation, yoga, group support, discussion of stressors, and building mindful approaches to dealing with these stressors. The program was developed in the 1970s by Jon-Kabat Zinn at the U Massachusetts Medical School. MBSR interventions for health-care professionals found empirical evidence to support benefits in mental and physical health in this population.\(^11\)\(^,\)\(^12\) It is traditionally taught for patients in 2.5-hour blocks weekly for 8 weeks plus a 5 to 6-hour silent retreat; programs for health professionals have been adapted to formats ranging from weekend intensives,\(^13\) to online, asynchronous training.\(^14\) Various projects have attempted to develop and apply abbreviated versions of mindfulness interventions to maximize outcomes while offsetting the limitation of time with positive results.\(^13\)\(^,\)\(^15\)\(^-\)\(^22\)

Multiple RCTs have shown that compared with control groups, nurses and physicians who participate in 4 to 8 sessions of mindfulness training report significantly lower levels of stress, fewer symptoms of burnout, and increased life satisfaction, empathy, and self-compassion.\(^9\)\(^,\)\(^23\)\(^-\)\(^26\) Therefore, mindfulness may be a powerful tool to enhance the patient–clinician relationship, improve decision making and diagnosis, and promote resilience.

Interventions have focused on improving clinicians’ and trainees’ communication skills with varied results. For instance, Krasner et al.\(^12\) found a mindful communication program improved various measures of well-being including symptoms of burnout among primary care physicians, while other studies have failed to achieve significant results.\(^27\) Researchers for each of these studies added to the call for more rigorous study of the impact that mindful communication may have on burnout and well-being for clinicians and trainees.

Although the evidence base for these interventions is growing, more information is needed to determine which strategies are feasible for busy clinicians and which bring about the greatest change with the most far-reaching impact. Based on the positive outcomes of our 2 studies using an abbreviated MBSR intervention for adolescents with congenital heart disease,\(^28\)\(^,\)\(^29\) we developed a program for the clinical staff in our Heart Institute to increase mindfulness and teach basic mind–body skills (MBS). Our goal was to decrease staff stress, increase our mindful awareness as caregivers, increase calm and compassionate care, and teach simple and accessible MBS for participants to use for themselves and other staff, patients, and family members. The program invited participants to learn MBS to use as “primary prevention” tools in their daily clinical practices as well as during acute stressful moments throughout their day. As this was a pilot program, we wanted to evaluate feasibility and acceptability of a 12-month program.

We developed the 12-month longitudinal mindfulness training program (Mindful Mentors, MM) for cardiology staff at a large free-standing, academic children’s hospital to answer three questions: 1. Is such a program feasible, that is, can we recruit at least 30 staff to participate and will at least 25 to complete outcome evaluations 12 months later? Will staff be able to get time off from their clinical areas to participate? 2. What quantitative outcomes (such as burnout, mindfulness, self-efficacy in providing non-drug therapies, confidence in providing compassionate care (CCC), stress, anxiety, and resilience) might be most sensitive to the intervention in a larger, controlled and adequately powered study? 3. Does participation lead to any qualitative changes in behavior such as development and implementation of mindfulness-related projects by program participants?
Methods

Study Design and Sample

This initiative was a prospective cohort, mixed methods approach, conducted at Children’s National Health System in Washington, DC, a free-standing academic children’s hospital between January, 2018 and January, 2019. Participants were primarily invited from the clinical staff of the Children’s National Heart Institute, with a few clinicians from other departments (Palliative Care, Hematology/Oncology) who learned of the program and asked to participate. Our goal was to enlist 30 participants for the pilot cohort and we accepted 38 participants. Participants were eligible to participate whether they were a nurse, advanced practice nurse, physician, psychologist, technician, social worker, child life specialist, or chaplain. Eligible staff were sent a program description and application and invited to apply. Applications needed to be signed and approved by the participant’s supervisor to ensure administrative support for attending the 2 all-day educational sessions (mandatory) and the monthly debrief/support sessions (whenever possible). Participants were allowed to use their administrative/educational time to attend. They did not need to use their vacation time.

Intervention

The 12-month program consisted of an initial 16 hours of intensive, interactive education/practice over 2 days separated by 1 month. The intervention was designed by the program faculty (authors of this manuscript) who are a group of clinicians from various disciplines and institutions with vast experience in mind body medicine. The faculty met by phone conference over several sessions to design the course in a format that would be able to be delivered in-person to a large group of healthcare professionals. The intensive sessions include training in several mindfulness meditation techniques and brief MBS including breathing techniques and meditations, walking meditation, body scan, lovingkindness, and self-compassion meditations. Critical elements such as peer support were also used in addition to other techniques including autogenic training, gratitude meditation, guided imagery, and pediatric modifications of the techniques for use with patients. In addition, there were detailed and interactive lectures, exercises and discussions about the science/neuroscience behind MBS, emotional boundaries, self-compassion, nonviolent, mindful and compassionate communication, misconceptions, overcoming barriers to practice, trauma-informed care, attunement and attachment practices, and mindful listening and speaking. The program taught these clinicians in a train-the-trainer format designed to prepare them to use these MBS techniques with patients, patients’ families, and their own colleagues once they were comfortable in their own self-practice. Daily and weekly homework was assigned for the 4 weeks in-between the two 8-hour initial sessions. Completing the homework was encouraged and each participant discussed their experience with it, but there was not a requirement to formally keep track of it.

The program also included monthly small group debriefing sessions to discuss how the participants were using what they learned, their perceived impact, sharing of ideas, and progress/roadblocks in their personal and professional use of the practices. In addition, each monthly session began with learning a new skill or technique. The third program component was quarterly refresher/education sessions, which were 2 hours in length and included learning new techniques and concepts such as “Compassionate Motivation” and “Clinician Mindfulness and Patient Safety.” This intervention format was believed to be more feasible yet still effective for the staff to participate in that most of them “don’t have time” to complete the 8-session formal MBSR program. Participants were paid their regular salary to attend the program, and they were able to use Educational/Administrative leave to attend. All of the sessions were conducted on weekdays during normal working hours. The faculty who taught the 16 hours of intensive training included 2 pediatricians who are nationally known experts in mindfulness in medicine, a doctoral prepared chaplain with extensive experience in mindfulness, communication, and trauma care; a doctoral prepared RN with 27 years of experience in pediatric electrophysiology who has extensively studied the effects of a MBSR intervention in adolescents with cardiac devices and/or cardiac diagnoses, and a master’s prepared MBSR expert who teaches MBSR and develops programming in mind–body medicine for medical students. The first author led the monthly debriefing sessions, in which participants learned a new technique and shared techniques they had been using with themselves, other staff, and patients. Discussion also included which techniques were felt to be beneficial or not, and participants offered support, encouragement, and suggestions to each other. The quarterly education sessions were taught by 2 of the faculty members who were local. For the final program meeting, participants were asked to develop an individual or group project using the techniques or concepts they had learned. The final session included project presentations by each participant (Table 4).
Outcome Measures

For this project, feasibility was assessed using the study design and following the areas of focus described by Bowen et al. 30 for feasibility studies.

1. Acceptability—how did the participants and their supervisors (whose commitment was needed for participation) react to the intervention?
2. Practicality—in the context of their busy clinical responsibilities, would the participants be able to participate in the “mandatory” 16-hour intensive training, two-third Quarterly Education sessions, and at least 40% of the monthly debriefing sessions.

The study design of this project asked the question “Can it Work?” Our cohort design compared the quantitative outcomes and qualitative data of individuals who participated in the intervention. In this initial program, there was no randomization, though the 12-month program allowed for several outcome measurement time points.

Feasibility was assessed by recruitment and attendance at the day-long intensive sessions, the monthly sessions, and completion of the baseline, post-16 hour training, 3- and 12-month follow-up surveys.

We assessed four negative outcomes (Stress, Distress, Burnout, and Anxiety) and four positive outcomes (Mindfulness, Self-efficacy, Compassionate Care, and Resilience).

Stress. We measured stress with Cohen’s 10-item Perceived Stress Scale (PSS), which has been used in multiple studies of health professionals and the general population. It has good internal reliability and external validity. Scores on the PSS may range from 0 to 40; higher scores indicate higher levels of perceived stress. Scores, which may improve with mindfulness training, range in the general population from 12 to 14, and among health professionals from 14 to 18.31,32

Distress. The Physician’s Wellbeing Index (PWBI) was used to assess distress. The PWBI is intended to include the domains of burnout, depression, stress, fatigue, and mental and physical quality of life (QOL). It consists of 7 yes/no items and respondents receive a score from 0 to 7 based on responses. At a threshold score of ≥ 4, the specificity for detecting medical students and practicing physicians with low mental QOL was 87.7% and 81.0%, respectively, and the sensitivity was 59.2% and 73.3%, respectively. The 7-item version of the PWBI was used because it has been validated and found to be a useful screening tool to identify distress in physicians and other health-care workers in areas which may negatively impact their practice.33,34 This scale has also been used to identify individuals, who are not health-care providers, in distress across a variety of domains and to identify individuals with high well-being.35

Burnout. Burnout was measured using 2 items from the Maslach Burnout Inventory (MBI),36 one each from the emotional exhaustion (EE) scale, and the depersonalization scale (DP).33,37 The range of scores for each question was 0 to 6. The 2 screening items were considered positive for burnout if the responses on either the EE or DP item were endorsed at least weekly (>3 on the 7-point Likert-type scale from never to daily). We defined burnout as a continuous variable as the total of the EE score plus the depersonalization score. As compared with the full MBI (22 items), in a study of pediatric residents, for the combined EE+DP screen, the specificity was 87% and sensitivity was 84% (LR+ = 6.4, 95% confidence interval [CI]: 5.3–7.8; LR – = 0.18, 95% CI: 0.16–0.21), with similar values in 2017. Predictive values in both years ranged between 81% and 89%.38,39

Anxiety. We assessed anxiety with the 8-item Patient-Reported Outcomes Measurement Information System (PROMIS) Anxiety Scale which has high reliability and construct validity.40,41 Each item on the scale has 5 responses ranging in value from 1 to 5. The range of raw scores on the 8-item scale is 8 to 40. The raw score translates into a standardized T-score with a mean of 50 and standard deviation (SD) of 10 in a normal population. For example, the total raw score of 13 converts to a T-score of 50.8 with a standard error (SE) of 2.2.

Mindfulness. We assessed mindfulness using the 10-item Cognitive and Affective Mindfulness Scale, Revised (CAMS-R); the CAMS-R has good internal consistency (α = .74–.80), and scores are significantly correlated with longer measures of mindfulness, well-being, clarity of feelings, adaptive regulation, and cognitive flexibility. Potential item scores range from 1 (low or poor mindfulness) to 4 (high or healthy mindfulness), with a range of 10 to 40 for the 10 items. The average item score in normative populations is 2.8 (standard deviation [SD] = 0.5).42

Self-Efficacy in Providing Non-Drug Therapies. We used the Self Efficacy in Providing Non-Drug Therapies (SEND) questionnaire, a 10-item measure with scores ranging from 0 to 100, with Cronbach’s alpha of .95 for self-efficacy in providing non-drug therapies to relieve common symptoms.43

Compassion. We used the Confidence in Providing Calm, Compassionate Care Scale (CCCS). The CCCS includes 10 items, and potential scores range from 0 to 100
(higher scores indicate greater confidence in ability to provide compassionate care). The CCCS has good internal reliability and correlates in expected directions with standardized measures of mindfulness, empathy, and resilience; average scores in other studies of health professionals range from 60 to 80.44

Resilience. Smith’s Brief Resilience Scale (BRS) was used in this study. The BRS consists of 6 items; 3 negative items and 3 positive items. Each item is scored on a Likert-type scale from 1 to 5, giving a range from 6 to 30. The total sum is then divided by the total number of questions answered to derive the score. The BRS demonstrated good internal consistency with Cronbach’s alpha ranging from .80 to .91 as well as good convergent validity and discriminant predictive validity.45

Data Collection and Management

Participants were invited to complete the 75-item survey on Survey Monkey (see Consort diagram, Figure 2). Survey data were exported from Survey Monkey in the Excel file format for analysis. Descriptive statistics including age range (by decade), staff role, gender, and prior experience with MBS were used to characterize participants. This survey was requested to be completed at baseline (pre-16 h training), immediately post 16-hour training, 3 months, and 12 months post initial training (see Timeline diagram). Qualitative program evaluation was completed after the initial 16 hours of training and at 12 months, the end of the program.

Data Analysis

The analysis data included four repeated measures survey datasets which were pretraining, postinitial training, 3-month, and 12-months post initial training. There are 8 domain measurements in each survey and some question items for each domain. All of the missing data in the domains except BRS and PROMIS domains were imputed with the mean of individual in the same domain.

We used the Wilcoxon signed-rank test to test whether there were differences at T1 (baseline), T2 (post 16 h training), T3 (3 months post initial training), and T4 (12 months post initial training). The exact McNemar’s test was used to compare the changes in burnout from baseline to each time point due to the data being dependent and small sample size. There were 35 records at T1, 23 records at T2, 24 records at T3, and 24 records at T4. Statistical analysis was performed using SAS 9.4.

Qualitative data were collected in course evaluations following the initial 16 hours of training and at completion of the program at 12 months. The open-ended questions were part of the Survey Monkey survey, and the individual’s comments were compiled on an excel spreadsheet and tabulated. In addition, qualitative data were collected at the monthly debriefing sessions related to techniques that were working or not, ideas and suggestions that group members shared with each other. Comments expressed by each participant were written down and summarized by the group leader. Qualitative data were compiled and grouped by theme using the content analysis method. There was no software used to compile these data.

Institutional Review Board and Ethical Approval Process

Because this was primarily a staff training initiative, the project was submitted to our institutional review board and approved exempt as a Quality Improvement Initiative.

Results

Figure 1 (Consort Diagram) illustrates the enrollment and dropout data of participants and their completion of outcome measures at each of the data collection time points. Of the 33 staff who completed the baseline survey, 2 moved out of the area, 2 dropped out due to illness, 2 took leave of absence from work, and 1 went on maternity leave (n = 7).

The original participants included a broad cross section of the staff workforce: 18 nurses, 5 staff physicians, 6 technicians, 3 social workers, 3 child life specialists, 1 psychologist, and 1 administrative assistant. The participants ranged in age from 25 to over 65 years. Most (64%) were Caucasian, 21% were African American, and 12% were Asian/other. Most (70%) reported previous training in mindfulness at baseline, and 39% reported missing one or more days of work in the 30 days prior to the first training session. Participants who remained throughout the program were similar to those at baseline (Table 1).

At baseline, before the intervention, participants reported high levels of stress compared with the normal population (30.7 vs population average of 12–14); 51% met criteria for burnout. At baseline, anxiety scores (raw) were higher than the normal population, while baseline scores for mindfulness, self-efficacy in providing non-drug therapies, confidence in compassionate care, and resilience were similar to scores for other health professionals (Table 2).39,42,43 There were 33 participants in the pretraining dataset, 22 participants in the immediate postintensive training dataset, and 24 participants in each of the 3- and 12-month postinitial training dataset.

Immediately following the 16-hour intensive intervention, the variables showing the most significant
improvement were self-efficacy in delivery non-drug therapies (SEND) and CCC, although anxiety and distress also improved significantly. However, after 3 months of practicing their new skills, there were significant improvements compared with baseline in every variable except resilience. These improvements were sustained at 12 months of follow-up (Table 2 and Figures 2(A) to (C)). Furthermore, by 12 months later, there was a substantial decrease in the percentage of participants who reported missing work in the past 30 days, from 39% at baseline, 25% at 3 months, and 29% at 12 months (Table 1).

Figure 1. Consort Diagram for Mindful Mentor Participation.

Table 1. Demographics of 33 Participants at Baseline and 24 Participants at 3 and 12 Months.

| Characteristic                        | Baseline N = 33 | Immediate N = 22 | 3-Month Follow-up N = 24 | 12-Month Follow-up N = 24 |
|---------------------------------------|-----------------|------------------|--------------------------|---------------------------|
| Age, years (n [%])                    |                 |                  |                          |                           |
| 18–24                                 | 0               | 0                | 0                        | 0                         |
| 25–34                                 | 8 (24%)         | 4 (18%)          | 5 (21%)                  | 5 (21%)                   |
| 35–44                                 | 12 (36%)        | 6 (27%)          | 9 (38%)                  | 9 (38%)                   |
| 45–54                                 | 7 (21%)         | 5 (23%)          | 4 (17%)                  | 4 (17%)                   |
| 55–64                                 | 4 (12%)         | 4 (18%)          | 3 (13%)                  | 3 (13%)                   |
| 65–74                                 | 2 (6%)          | 2 (9%)           | 2 (8%)                   | 2 (8%)                    |
| Race (n [%])                          |                 |                  |                          |                           |
| Caucasian                             | 21 (64%)        | 14 (64%)         | 15 (63%)                 | 15 (63%)                  |
| African American                      | 7 (21%)         | 3 (14%)          | 5 (21%)                  | 5 (21%)                   |
| Asian or Other                        | 4 (12%)         | 3 (14%)          | 3 (13%)                  | 3 (13%)                   |
| Previous mindfulness training (%Yes)  | 23 (70%)        | N/A              | N/A                      | N/A                       |
| Missed work in the past 30 days (%Yes)| 13 (39%)        | 9 (41%)          | 6 (25%)                  | 7 (29%)                   |

Abbreviation: N/A, not applicable. Numbers may not add to 100% due to missing responses for some questions and rounding.
Program evaluations were completed after the initial 16-hour intensive training and at the end of the program at 12 months. All participants (100%) said they would recommend the program to others and that the training met its objectives. Participants spread the word about the program to other staff, so that the following year we had twice the number of participants from throughout the hospital registering and participating in our second cohort.

Qualitative themes were reported by respondents in response to the question: what is your greatest hope for this training? The three most common responses were: (1) “I hope to apply what I learned to help other staff become more mindful, and for all of us to apply what we’ve learned to our patients;” (2) “I hope to become a better practitioner”; and (3) “I hope to continue to improve myself and to use the techniques I learned in my daily practice” (Table 3).

Participants were asked to plan and/or implement projects in their clinical areas related to their training within 12 months after the beginning of the program. Participants generated a number of different ideas. For example, 4 participants jointly planned to incorporate mindfulness education in the Nursing orientation curriculum on the Cardiology and Cardiac Intensive Care Units. Three participants planned to implement a weekly meditation program with staff before staff meetings and before nursing rounds. Three participants planned an innovative integrative clinical service including mindfulness meditation for parents and patients as well as acupuncture and Healing Touch for patients (Table 4). Each of the projects listed have been fully implemented or are in the process of implementation.

Discussion

In our multidisciplinary sample, largely from a pediatric cardiac care setting, the MM program was feasible and acceptable and showed statistically significant and meaningful benefit for clinicians in reducing personal distress, anxiety, burnout; and improving compassionate care, mindfulness, and self-efficacy in providing non-drug therapies, with benefits sustained over the 12 months of the program. In addition, participants had developed and maintained mindfulness-based and mind–body programming to support on-going implementation.

Over the 12 months of the program, the MM participants emerged as leaders and resources for their clinical units in the areas of stress reduction and MBS techniques. A noticeable culture shift also was occurring throughout the institution, as evidenced by the MM program receiving the hospital’s Core Values Award, a hospital-wide competitive award which is accompanied by a grant to support program continuation and funding for research as well as projects developed by the participants. This award was developed by hospital administration to promote programs which are congruent with the hospital values of Compassion, Commitment, and Connection, and the winner was chosen by the highest levels of administration. Over the last 2 years, well-being of staff and patients/families has become a recognized theme throughout the hospital, garnering much support throughout both clinical and nonclinical departments.

Individual and organizational strategies have been found to produce significant outcomes in the reduction of burnout and some data indicate organizational interventions may be more impactful in reducing burnout.

Table 2. Quantitative Outcomes Among the Participants Responding at Each Time: Baseline, Immediately, 3 Months, and 12 Months later and P values of Wilcoxon Signed-rank Tests by Comparing Posttrainings With Baseline.

| Scale                          | Baseline Mean (SD) N = 33 | Immediate Mean (SD) N = 22 | P valuea | 3 Months Mean (SD) N = 24 | P valuea | 12 Months Mean (SD) N = 24 | P valuea |
|-------------------------------|----------------------------|-----------------------------|----------|---------------------------|----------|-----------------------------|----------|
| Negative factors              |                            |                             |          |                           |          |                             |          |
| Stress (PSS)                  | 30.7 (2.6)                 | 30.5 (2.8)                  | .80      | 19.8 (2.6)                | <.0001   | 20.5 (2.6)                  | <.0001   |
| Distress (PWBI)               | 2.5 (2.0)                  | 1.3 (1.4)                   | .04      | 1.3 (1.9)                 | .01      | 1.6 (1.7)                   | .04      |
| Burnout (MBI)                 | 8.2 (2.9)                  | 7.2 (2.7)                   | .44      | 5.0 (2.9)                 | <.0001   | 5.5 (2.9)                   | <.0001   |
| Anxiety                       | 18 (5.9)                   | 14.5 (5.0)                  | .02      | 13.7 (3.8)                | .02      | 14.8 (4.4)                  | .01      |
| Positive factors              |                            |                             |          |                           |          |                             |          |
| Mindfulness (CAMS-R)          | 26.6 (3.6)                 | 28.5 (3.3)                  | .07      | 29.1 (4.0)                | .01      | 29.5 (3.8)                  | .002     |
| Self-efficacy (SEND)          | 52.5 (20.2)                | 72.1 (14.2)                 | <.001    | 78.8 (6.9)                | <.001    | 78.1 (13.3)                 | <.0001   |
| Compassionate care (CCCS)     | 60.8 (8.4)                 | 71.6 (6.0)                  | <.001    | 74.1 (9.0)                | <.0001   | 76.2 (8.0)                  | <.0001   |
| Resilience (BRS)              | 2.9 (0.2)                  | 2.9 (0.5)                   | .65      | 2.9 (0.5)                 | 1        | 2.9 (0.3)                   | .66      |

Abbreviations: BRS, Brief Resilience Scale; CAMS-R, Cognitive and Affective Mindfulness Scale, Revised; CCCS, Calm, Compassionate Care Scale; MBI, Maslach Burnout Inventor; PSS, Perceived Stress Scale; PWBI, The Physician's Wellbeing Index; SEND, Self Efficacy in Providing Non-Drug Therapies.

P values are for comparisons with baseline.

*Test only uses participants with data available at both time points.
than individual interventions. The reasons for this appear to be 3-fold; (1) underlying systemic struggles leading to workplace burnout are more likely to be mediated by organizational approaches, (2) individual interventions such as mindfulness are more likely to be effective when also supported by organizational approaches that impact improvements in communication among members of the team, teamwork, job control, and (3) organizational support for the building of individual strengths during work hours as opposed to on employees’ own time demonstrates greater organizational engagement and commitment to staff well-being.

Still, more research is needed to explore the most efficacious and efficient approaches to both prevent and treat burnout among health-care workers.

These MM program findings are consistent with studies showing that structured mindfulness programming reduces clinician burnout and improves psychological functioning in postprogram evaluation including a recent meta-analysis. In our sample, the benefits for burnout and coping were sustained at 12-month follow-up, as Krasner et al. found with mindful communication, demonstrating positive outcomes at 12- and 15-month follow-up. Although additional research is needed to investigate patient outcomes directly, it has been suggested that decreased provider burnout and increased mindfulness are likely to be associated with improved patient care and safety. In addition, the MM program’s positive effect on self-efficacy of using non-drug therapies in patient care and increased confidence providing compassionate patient care is of particular note, for the potential benefits related to both job satisfaction and the care delivered to patients. These results are in line with a recent review in which healthcare-reported patient care, safety, treatment outcomes, and patient-centered care.

Table 3. Qualitative Data Themes at 12 Months.

| Question: What is your greatest hope for this training? |
|--------------------------------------------------------|
| “I hope to apply what I have learned to help other staff become more mindful, and for all of us to apply what we have learned to our patients.” (N = 12) |
| “I hope to become a better practitioner.” (N = 12) |
| “I hope to continue to improve myself and to use the techniques I learned in my daily practice.” (N = 11) |
| “I hope that it continues and is offered to everyone at any level.” (N = 4) |

Figure 2. (a) Improvements in Confidence in Providing Calm, Compassionate Care Scale (CCCS), Self Efficacy in Providing Non-Drug Therapies (SEND) Sustained Over Time. (b) Decreases in Patient-Reported Outcomes Measurement Information System Anxiety Scale (PROMIS) Sustained Over Time. (c) Decreases in Distress as Measured by the Physician’s Wellbeing Index (PWBI) Sustained Over Time.

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| “I hope that it continues and is offered to everyone at any level.” (N = 4) |

Still, more research is needed to explore the most efficacious and efficient approaches to both prevent and treat burnout among health-care workers.

These MM program findings are consistent with studies showing that structured mindfulness programming reduces clinician burnout and improves psychological functioning in postprogram evaluation including a recent meta-analysis. In our sample, the benefits for burnout and coping were sustained at 12-month follow-up, as Krasner et al. found with mindful communication, demonstrating positive outcomes at 12- and 15-month follow-up. Although additional research is needed to investigate patient outcomes directly, it has been suggested that decreased provider burnout and increased mindfulness are likely to be associated with improved patient care and safety.

In addition, the MM program’s positive effect on self-efficacy of using non-drug therapies in patient care and increased confidence providing compassionate patient care is of particular note, for the potential benefits related to both job satisfaction and the care delivered to patients. These results are in line with a recent review in which healthcare-reported patient care, safety, treatment outcomes, and patient-centered care.
A unique aspect of MM is the on-going mindfulness and MBS programs developed by participants to support their own mindfulness practice, provide peer support with a shared sense of “community” and mission, and to encourage integrating MBS and instruction into clinical care. The multidisciplinary team-based approach to this intervention encouraged all disciplines to work together, as they did throughout the program in both the educational and debriefing sessions. The desire to incorporate MBS and mindful approaches to their personal and professional lives was a common thread throughout the group and was a reason why each participant applied to the program as evidenced by their personal statements on their applications. Many of the MM participants work with pediatric congenital heart disease patients who experience significant anxiety related to their clinical conditions and have been shown to benefit from mindfulness and MBS teaching. The skills learned throughout the program can be used as basic “primary prevention” tools by clinicians to help patients cope with stress in the moment. The MM program encourages participants to use and teach mindfulness and MBS practices in their direct clinical care, thereby, increasing the number of patients (and parents) who are offered MBS.

There are several study limitations, which limit the generalizability of our findings. The program was taught at a single children’s hospital and benefited from both philanthropic and institutional support. Also, there was no control condition for comparison, so the program benefits seen may not be specific to the MBS aspects of the program but rather to the nonspecific benefits of the group activities or to secular changes over time. The primary goal of this program was to evaluate feasibility, which was demonstrated by participation over the course of 12 months, and spreading the word about the program to other staff, so that the following year twice the number of participants from throughout the hospital registered and participated in the second cohort.

In conclusion, our findings suggest that the MM program is feasible, can be successfully implemented and replicated with institutional support, and has the potential for beneficial effects, including meaningful outcomes of reduced health-care provider stress and burnout, increased self-efficacy in using nonpharmacological approaches to reduce distress in patients and their families, and on-going participant engagement. In addition, the impact of participants teaching techniques to coworkers and other staff to use for themselves and their patients can increase the impact of this program beyond any individual participant. The MM program has the potential to change the entire institutional culture to one which sees the value of and promotes mindfulness and mind-body approaches to improve self-care of health-care professionals and to improve patient and family care. Based on the successful outcomes of the pilot group, a second, larger cohort (n = 60) is currently being implemented with participants from almost every department and unit in our hospital, each in the process of developing their own innovative MM projects. Future research will include a control group and should explore the key elements of optimized implementation as well as assessment of the impact of the program on patient care outcomes and experience.

Table 4. Mindful Mentor Formal Projects (Separate From Individual Daily Clinical Activities With Patients; N = 25).

| Incorporate mindfulness education into Nursing orientation curriculum on the Cardiology and Cardiac Intensive Care Units including classroom education and practical application. (N = 4) |
| Measure subjectively stressed staff heart rates before and after a short mindful breathing session (2–5 mins) using a FitBit tracker (N = 3) |
| Implement weekly meditation program with staff before staff meetings and before nursing rounds (N = 3) |
| Development of biweekly “Integrative clinic” that includes mindfulness meditation, for parents and patients, acupuncture, and healing touch for patients (N = 3) |
| Promote mindfulness techniques in Cardiology clinic-laminated cards for patients to take in each clinic room, meditation/breathing technique videos playing in the waiting room for patients/families, Mindful Mentor “on call” in clinic for patient needing helpful intervention (N = 3) |
| Develop a preceptor “boot camp” for nursing preceptors to learn to teach techniques to new staff on the unit. (N = 2) |
| Make a “relaxation box” for patients in the echo lab filled with laminated cards and other tools for various age-appropriate mindfulness techniques/games. Use Interpreter for patients who do not speak English but could benefit from stress reduction. (N = 2) |
| Coordinate a Mindful Mentors team for the Annual Race for Every Child Fundraiser event (N = 2) |
| “Thoughtful Thursday”—engaging in a mindful activity with patients (game, project, etc) every Thursday (N = 1) |
| Daily brief “Mindful Moments” for administrative staff-breathing techniques, stretching exercises (N = 1) |
| Emergency room—Give meditation stone to anxious patients, waiting room group meditation program, mindfulness moments with staff (N = 1) |

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