

Presence, Resilience, and Compassion Training in Clinical Education (PRACTICE): A Follow-Up Evaluation of a Resident-Focused Wellness Program

Richard R. Szuster¹, MD

Jane Onoye, PhD

Courtenay Matsu, MD

ABSTRACT

Background Graduate medical education is demanding, and many residents eventually experience a reduced sense of well-being. Interventions are in development, but knowledge gaps remain in terms of time commitment and efficacy.

Objective To evaluate a mindfulness-based wellness program for residents—PRACTICE (Presence, Resilience, and Compassion Training in Clinical Education).

Methods PRACTICE was delivered virtually by the first author in the winter and spring of 2020-2021. The intervention totaled 7 hours delivered over 16 weeks. An intervention group of 43 residents (19 primary care and 24 surgical) participated in PRACTICE. Program directors electively enrolled their programs, and PRACTICE was integrated into residents' regular educational curriculum. The intervention group was compared to a non-intervention group of 147 residents whose programs did not participate. Repeated measure analyses were conducted before and after the intervention using the Professional Fulfillment Index (PFI) and Patient Health Questionnaire (PHQ)-4. The PFI measured professional fulfillment, work exhaustion, interpersonal disengagement, and burnout; the PHQ-4 measured depression and anxiety symptoms. A mixed model was used to compare scores between the intervention and non-intervention groups.

Results Evaluation data were available from 31 of 43 (72%) residents in the intervention group, and from 101 of 147 (69%) residents in the non-intervention group. Significant and sustained improvements were demonstrated in professional fulfillment, work exhaustion, interpersonal disengagement, and anxiety in the intervention group versus the non-intervention group.

Conclusions Participation in PRACTICE resulted in improvements in measures of resident well-being that were sustained over the 16-week duration of the program.

Introduction

Graduate medical education (GME) is demanding, and many residents eventually experience a reduced sense of well-being, including symptoms of burnout¹—a syndrome characterized by emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment.² The burnout syndrome is associated with a range of negative consequences in personal,³⁻⁶ patient care,⁷⁻⁹ and medical system¹⁰ domains.

Workplace factors are thought to be important drivers of burnout in GME, indicating the need for institutional- and system-level interventions.¹¹ Additionally, a variety of interventions have been implemented at a resident level. Successful resident programs have tended to extend serially over weeks or months and take place during protected educational time.¹² Yet significant knowledge gaps remain regarding the utility of implementing resident-level interventions, including the optimal structure, content, duration, and expected outcomes.

In this report we describe the evolution of a wellness program developed specifically for residents. It is a modified version of a previously described pilot program designated PRACTICE (Presence, Resilience, and Compassion Training in Clinical Education).¹³ The initial pilot program consisted of four 2-hour sessions conducted over 4 weeks. By the end of the program, resident well-being measures had significantly improved. However, the number of participants was small and included only postgraduate year (PGY)-1 residents in nonsurgical specialties. Also, improvements in well-being scores were not sustained and had reverted to pre-intervention levels 3 months after program conclusion.

Building upon the pilot study, the current PRACTICE intervention added all PGYs and included residents from surgical specialties. Additionally, the program was extended in time by adding 2 booster sessions. The duration of sessions (excluding the first) was reduced from 2 hours to 1 hour. This concentrated PRACTICE into a 7-hour, 6-session program, taught during protected educational time, and

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delivered over 16 weeks. The current study explores whether the improvement in well-being measures noted in the pilot study could be generalized to a broader range of residents, and whether extending the program by adding booster sessions would result in sustained improvements.

Methods

Setting and Participants

The program was conducted with residents in training at the Hawaii Residency Programs and the University of Hawaii in Honolulu, Hawaii. The program was designed as a quality improvement project and implemented over a 16-week period in the winter and spring of 2020-2021. The program was open to all Hawaii Residency Programs, and program directors electively enrolled their programs in the intervention during the index year. All residents in the included programs were expected to participate in PRACTICE as part of their regular educational curriculum, and the program was delivered during protected educational time. Nineteen primary care residents and 24 surgical residents participated in PRACTICE and comprised the intervention group. PRACTICE was taught to the primary care and surgical groups separately. A group of 147 residents in mixed specialty training programs whose programs did not participate in PRACTICE in the index year comprised the non-intervention group.

Intervention

The intervention was a core 4-week mindfulness-based program consisting of one 2-hour introductory session followed by 3 weekly 1-hour sessions.

Objectives

To evaluate the impact of a mindfulness-based wellness program on resident well-being.

Findings

Resident well-being measures improved and were sustained over the 16-week duration of the program.

Limitations

The retrospective before-and-after design afforded less control than a randomized control study.

Bottom Line

Mindfulness-based wellness programs for residents can be effective, but additional research is needed to further clarify their optimal structure, content, duration, and how they might optimally interface with system-level and institutional interventions.

Additionally, two 1-hour booster sessions were implemented—one 6 weeks after the core program (week 10), and a second 12 weeks after the core program (week 16). Due to COVID-19 pandemic conditions, the program was delivered remotely using a video conferencing format. The program was taught by the first author who is a trained Mindful Practice¹⁴ facilitator. TABLE 1 summarizes the PRACTICE session modules.

Each session included a focus on developing mindfulness-based skills to support individual well-being and also on group exercises designed to bolster interpersonal connectedness and support within the resident community. Sessions were structured to include: (1) guided mindfulness meditation practice; (2) didactic presentations; (3) experiential exercises done in groups; and (4) homework—recommended daily meditation practice and exercises in bringing mindful attention to day-to-day living.

TABLE 1
PRACTICE Curriculum—Session Topics and Descriptions

Session	Topic	Description
No. 1 (Week 1) 2 hours	Introduction to Mindfulness I: <i>Presence</i>	An exploration of the phenomenology of attention and the development of presence—a capacity to be more engaged with the immediacy of experience.
No. 2 (Week 2) 1 hour	Introduction to Mindfulness II: <i>Resilience</i>	Mindfulness practice as a support for presence and emotional regulation when dealing with challenges related to training.
No. 3 (Week 3) 1 hour	Introduction to Mindfulness III: <i>Compassion</i>	Mindfulness practice as a support for presence and emotional regulation when dealing with patients' illnesses, suffering, and death—cultivation of compassion for self and others.
No. 4 (Week 4) 1 hour	Stayin' Alive: <i>Integration</i>	Putting it together: presence/resilience/compassion—staying present, engaged, and enlivened.
No. 5 (Week 10) 1 hour	Mindfulness and Cognition: <i>How Doctors Think</i>	Mindfulness as related to Type 1 and Type 2 thinking, medical problem solving, and medical errors. Introduction to "beginner's mind" and the creative mind in medicine.
No. 6 (Week 16) 1 hour	Physician as Healer: <i>A Deeper Dive</i>	Mindfulness as related to compassion fatigue, compassion satisfaction, meaning in medicine, and the therapeutic impact of the physician's presence.

Abbreviations: PRACTICE, Presence, Resilience, and Compassion Training in Clinical Education.

TABLE 2

Estimated Means $\pm$ Standard Error and Statistical Tests for Outcome Measures Across Pre-Intervention Baseline (T1), Post-Core Intervention (T2), and Post-Booster (T3) for PRACTICE Participants With Scores at All Timepoints

Measure	T1 Baseline (Week 1)	T2 Post-Core Intervention (Week 4)	T3 Post-Booster (Week 16)	Statistic	P value	Bonferroni Adjusted Pairwise Comparisons Mean Difference (95% CI)	P value
PF (n=27)	1.988 $\pm$ 0.159	2.179 $\pm$ 0.185	2.264 $\pm$ 0.169	$F(2,25)=1.644$	.21	T2-T1=-0.191 (-0.188, 0.570)	.63
						T3-T2=0.085 (-0.282, 0.452)	>.99
						T3-T1=0.276 (-0.113, 0.666)	.24
WE (n=28)	2.054 $\pm$ 0.158	1.840 $\pm$ 0.196	1.813 $\pm$ 0.174	$F(2,26)=1.360$	.27	T2-T1=-0.214 (-0.567, 0.139)	.40
						T3-T2=-0.027 (-0.310, 0.256)	>.99
						T3-T1=-0.241 (-0.634, 0.152)	.39
ID (n=28)	1.720 $\pm$ 0.219	1.387 $\pm$ 0.228	1.309 $\pm$ 0.191	$F(2,26)=3.210$	.06	T2-T1=-0.333(-0.812, 0.146)	.26
						T3-T2=-0.078 (-0.435, 0.279)	>.99
						T3-T1=-0.411 (-0.817, -0.005)	.047^a
BO (n=28)	1.854 $\pm$ 0.184	1.568 $\pm$ 0.208	1.517 $\pm$ 0.177	$F(2,26)=2.936$	.07	T2-T1=-0.286(-0.668, 0.097)	.20
						T3-T2=-0.051 (-0.335, 0.233)	>.99
						T3-T1=-0.337 (-0.687, 0.013)	.06
DEP (n=28)	1.893 $\pm$ 0.389	1.321 $\pm$ 0.326	1.214 $\pm$ 0.310	$F(2,26)=2.400$	.11	T2-T1=-0.571 (-1.284, 0.141)	.15
						T3-T2=-0.107 (-0.638, 0.424)	>.99
						T3-T1=-0.679 (-1.488, 0.131)	.13
ANX (n=28)	2.179 $\pm$ 0.345	1.679 $\pm$ 0.334	1.607 $\pm$ 0.331	$F(2,26)=3.500$	.045^a	T2-T1=-0.500 (-1.065, 0.065)	.10
						T3-T2=-0.071 (-0.627, 0.484)	>.99
						T3-T1=-0.571 (-1.165, 0.022)	.06

Abbreviations: PRACTICE, Presence, Resilience, and Compassion Training in Clinical Education; PF, professional fulfillment; WE, work exhaustion; ID, interpersonal disengagement; BO, burnout (mean composite of WE and ID scores); DEP, depression; ANX, anxiety.

Note: Post hoc pairwise comparisons also shown.

^a Significant at .05 level.

Outcomes Measured

Resident well-being was measured using the Professional Fulfillment Index (PFI)¹⁵ and the Patient Health Questionnaire (PHQ)-4.¹⁶ The PFI subscales assessed professional fulfillment (PF), work exhaustion (WE), interpersonal disengagement (ID), and burnout (BO; mean composite of WE and ID scores). The PFI was selected as a reliable instrument with sufficient validity evidence that correlates well with other tools commonly used to assess physician well-being. The PHQ-4 was used to measure depression (DEP) and anxiety (ANX) symptoms.

For the intervention group, well-being was measured pre-intervention (week 1), after the 4-week core program (week 4), and after the 2 booster sessions (week 16). Concurrently, the non-intervention group was surveyed at week 1 and again at week 16. Anonymous survey responses for both intervention and non-intervention groups were programmed to be linked over time points. In order to preserve the anonymity of participants, the specific programs involved were not identified.

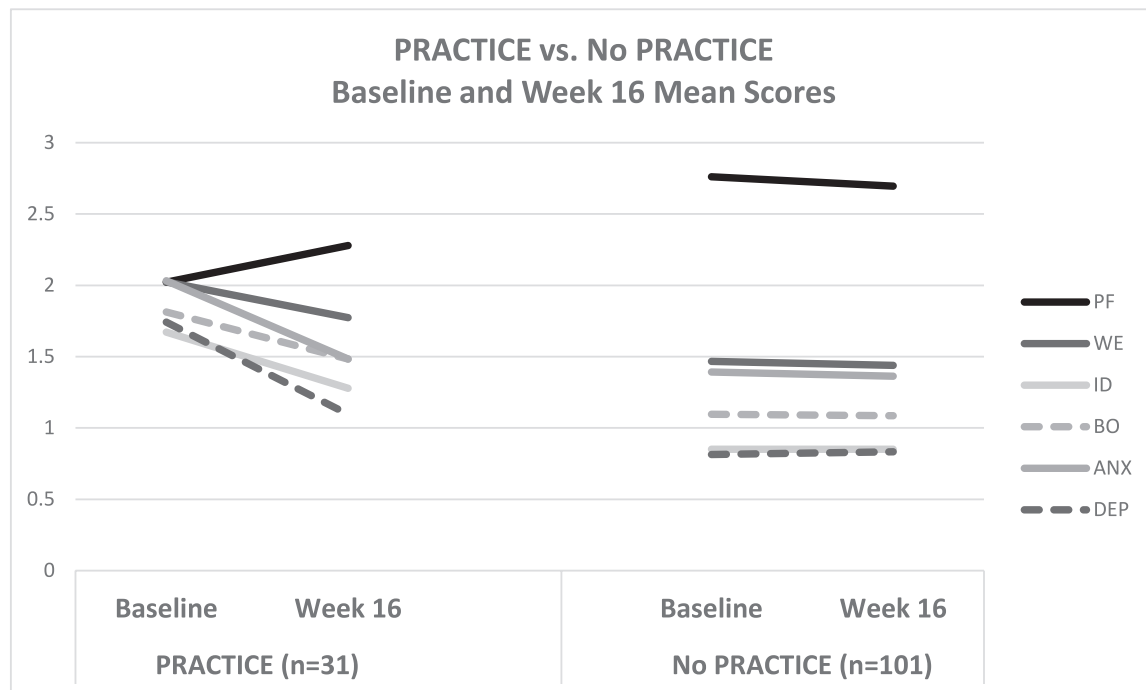
Analysis of the Outcomes

Matched scores for the intervention group at pre-intervention (week 1), post-core intervention (week 4), and post-booster (week 16), on the PFI for the PF, WE, and ID subscales, overall BO score, and the PHQ-4 DEP and ANX symptom scales, were examined for impact of the program and booster sessions using repeated measure analysis of variance tests. Differences in scores were also analyzed using linear mixed models between the intervention and non-intervention comparison groups and for the effect of time, regardless of intervention, within subjects at week 1 and at week 16. All statistical procedures were performed using SPSS Statistics 26 (IBM Corp).

Ethics approval for the retrospective review of collected and de-identified quality improvement data was granted by the University of Hawaii Institutional Review Board.

Results

Evaluation data were available from 31 of 43 (72%) residents in the intervention group and from 101 of

**FIGURE 1**

Professional Fulfillment, Work Exhaustion, Interpersonal Disengagement, Burnout, Anxiety, and Depression Mean Scores From Baseline to Week 16 for Intervention vs Non-Intervention Groups

Abbreviations: PRACTICE, Presence, Resilience, and Compassion Training in Clinical Education; PF, professional fulfillment; WE, work exhaustion; ID, interpersonal disengagement; BO, burnout (mean composite of WE and ID scores); ANX, anxiety; DEP, depression.

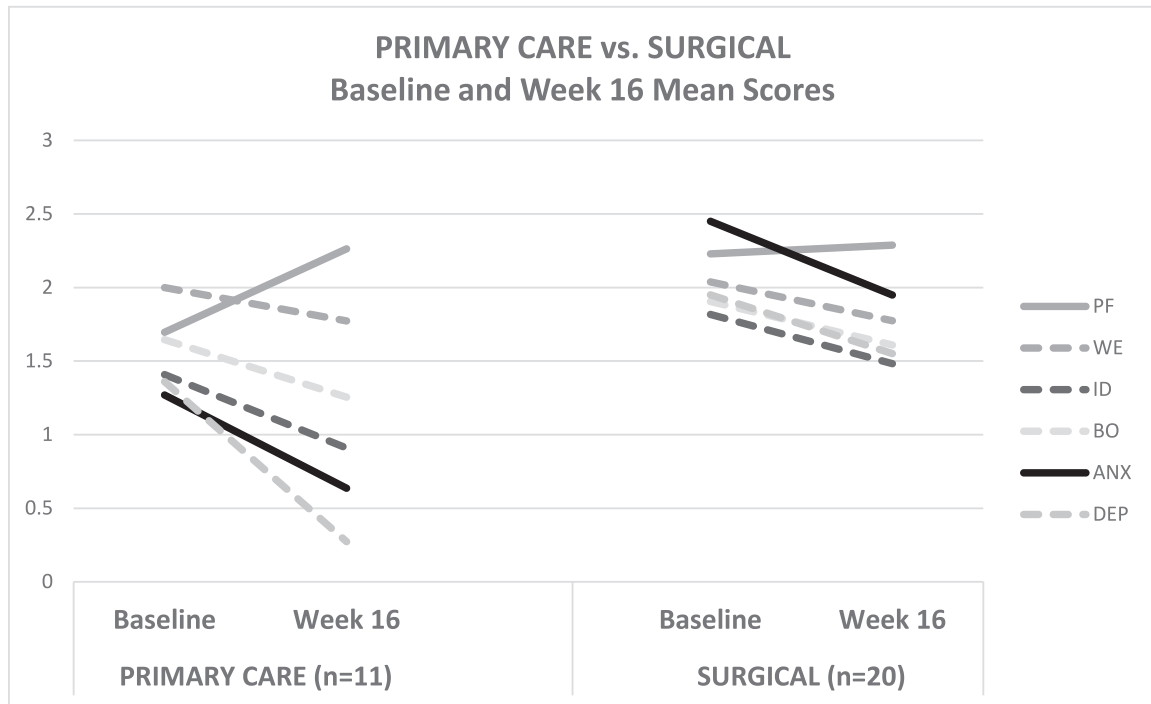
Note: Means for BO and DEP with unequal variances shown in dashed lines.

147 (69%) residents in the non-intervention group. For the intervention group there was a significant difference in mean scores for ANX across time. Post-hoc tests with Bonferroni correction showed significant reductions in ID from baseline (week 1) to post-booster (week 16) timepoints. No significant differences (increases or decreases) were seen in measures from the post-core intervention (week 4) to post-booster (week 16) timepoints (see TABLE 2).

FIGURE 1 illustrates descriptive mean baseline and week 16 scores for PF, WE, ID, BO, DEP, and ANX for the intervention and the non-intervention groups. Linear mixed model tests for comparison of the intervention group to the non-intervention group by time (scores at baseline to week 16) showed there was a significant main effect on PF for the intervention ($F[1,131]=18.038$, $P<.001$), none for main effect of time, and a significant interaction of the intervention by time ($F[1,131]=5.484$, $P=.04$). For WE, there were both significant main effects of time ($F[1,131]=3.015$, $P=.022$) and intervention ($F[1,131]=8.832$, $P=.004$), but no significant interaction of the 2. For ID, there were both significant main effects of time ($F[1,131]=8.571$, $P=.004$) and intervention ($F[1,131]=17.965$,

$P<.001$), and a significant interaction between the 2 ($F[1,131]=8.571$, $P=.004$). There was a significant main effect for time for ANX ($F[1,131]=4.052$, $P=.046$), none for main effect of the intervention or interaction of the intervention by time ($F[1,131]=3.269$, $P=.073$). Levene's tests rejected the null hypothesis of equal variances for baseline scores for BO ($F[1,131]=10.399$, $P=.002$) and DEP ($F[1,131]=16.340$, $P<.001$); therefore, no models were run.

Additional analyses to examine potential differences in effects of the intervention (time) by residency program (primary care vs surgical) were conducted using linear mixed modeling. FIGURE 2 depicts mean baseline and week 16 scores for PF, WE, ID, BO, DEP, and ANX for primary care vs. surgical residency participants in the intervention. There was a significant main effect on PF for time ($F[1,29]=5.709$, $P=.024$), but none for main effect of residency program type or interaction of program type by time ($F[1,29]=3.738$, $P=.06$). For WE, there were no significant main effects of time or the program type, or their interaction. For ID, there was a significant main effect of time ($F[1,29]=7.462$, $P=.011$), none for program type,

**FIGURE 2**

Professional Fulfillment, Work Exhaustion, Interpersonal Disengagement, Burnout, Anxiety, and Depression Mean Scores From Baseline to Week 16 for Primary Care vs Surgical Residency Groups Participating in the PRACTICE Program

Abbreviations: PRACTICE, Presence, Resilience, and Compassion Training in Clinical Education; PF, professional fulfillment; WE, work exhaustion; ID, interpersonal disengagement; BO, burnout (mean composite of WE and ID scores); ANX, anxiety; DEP, depression.

Note: Means for WE, ID, and BO with non-significant main and interaction effects of program type and for DEP with unequal variances shown in dashed lines.

and no interaction between the 2. For BO, there was a significant main effect for time ($F[1,29]=6.851$, $P=.014$), none for program type, and no interaction of time with program type. There were significant main effects of time for ANX ($F[1,29]=6.397$, $P=.017$) and main effect for program type ($F[1,29]=4.501$, $P=.043$), but not for the interaction of time by program type. For DEP, Levene's test rejected the null hypothesis of equal variances for week 16 scores for ($F[1,29]=8.063$, $P=.008$); therefore, no model was run.

Discussion

The results presented herein support the inclusion of a resident-based intervention as part of a GME wellness program. Residents who participated in PRACTICE showed significant improvements in measures of professional fulfillment, work exhaustion, and interpersonal disengagement when compared to the non-intervention group. The benefits were similar for both primary care and surgical residents.

An important finding was that adding booster sessions resulted in enduring benefits. The current

PRACTICE program extended over 16 weeks with gains maintained. This contrasts with our previous 4-week pilot study where gains dissipated over the same time period.¹³ The implication is that resident wellness programs should not be conceptualized as short-term interventions. Rather, longer-term programs are needed to maintain gains.

A central focus of PRACTICE was on residents' emotional experiences during training. Research has demonstrated that emotional distress in residency is correlated with emotional exhaustion and depersonalization 10 years later in professional practice¹⁷—a finding that highlights the importance of developing and implementing interventions during residency. The approach taken in PRACTICE was mindfulness-based and focused on the mitigation of current emotional distress while also supporting the development of greater emotional resiliency.^{18,19}

A second major focus of PRACTICE was on interpersonal relatedness within the resident groups—an approach that builds on research demonstrating the positive impacts of peer support on resident well-being.²⁰ Group exercises were employed and relied on the principles of narrative medicine²¹

and appreciative inquiry.²² They were integrated into each session and encouraged personal exploration of the thematic content of the teaching modules. An emphasis on building a capacity for mutual sharing, understanding, and support was central to this aspect of the program and intended to facilitate the development of a supportive peer community.

PRACTICE was concentrated into 7 hours of protected educational time. Integration into the curriculum of participating programs proved to be feasible. Replication at other training sites would require familiarity with teaching mindfulness-based interventions. To support replication, video recordings of the PRACTICE session modules and related resources can be accessed online.²³

This study has limitations. PRACTICE was implemented and evaluated as a quality improvement project. The retrospective before-and-after design afforded less control than a rigorous randomized control study. Additionally, data collection relied upon voluntary completion and submission of evaluations at the designated time points. Rates of completion were 31 of 43 (72%) for the intervention group and 101 of 147 (69%) for the non-intervention group. In the analyses, the sharply different numbers of the 2 groups, and missing repeated measures data, suggest that a larger sample of complete participant data may result in more robust findings. While our results support the utility of resident-level interventions, additional research is needed to further clarify their optimal structure, content, and duration. Also, research is needed to explore the ways resident-focused interventions might optimally interface with system-level and institutional interventions.

Conclusions

Participation in PRACTICE resulted in improvements in measures of resident well-being that were sustained over the 16-week duration of the program.

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Richard R. Szuster, MD, is Assistant Clinical Professor of Psychiatry, John A. Burns School of Medicine, University of Hawaii at Manoa; **Jane Onoye, PhD**, is Associate Professor of Psychiatry, John A. Burns School of Medicine, University of Hawaii at Manoa; and **Courtenay Matsu, MD**, at the time of program evaluation, was Chief of Staff/Director of Corporate Development, Hawaii Residency Programs Inc.

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Corresponding author: Richard R. Szuster, MD, University of Hawaii at Manoa, richard@szusmd.com

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