Feature Article

Effects of a Technology-Assisted Meditation Program on Healthcare Providers' Interoceptive Awareness, Compassion Fatigue, and Burnout

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Research suggests that meditation can relieve stress, cultivate self-regulation skills, improve ability to focus, and modify risk for compassion fatigue (CF) and burnout in healthcare providers. However, studied interventions are time-consuming and combining disparate approaches, resulting in unclear mechanisms of effect. This pilot study examined a novel 6-week technology-assisted meditation program, coherently grounded in the system of yoga therapy that required minimal time. Five 10- to 12-minute meditations were offered via smartphone apps supported by biweekly e-mails. Hospice and palliative professionals at a Midwestern US healthcare network participated in the program (n = 36). Each meditation integrated attention, synchronized breath, gentle movements and a meditation focus. Weekly e-mails introduced a new meditation and reminded participants how and why to practice. The participants used the meditations a mean of 17.18(SD, 8.69) times. Paired *t* tests found significant presurvey to postsurvey improvements for CF/burnout ($P < .05$) and interoceptive awareness ($P < .001$). Participation significantly heightened perceived ability and propensity to direct attention to bodily sensations, increased awareness of physical sensations' connections to emotions, and increased active body listening. The technology-assisted yoga therapy meditation program successfully motivated providers to meditate. The program required minimal time yet seemed to reduce CF/burnout and improve emotional awareness and self-regulation by heightening attention to present-moment bodily sensations.

KEY WORDS

compassion fatigue, meditation, self-control, smartphone, yoga, yoga therapy

INTRODUCTION

Meditation shows promise as a method to counteract or prevent compassion fatigue (CF), burnout, and associated negative personal health issues that can emerge when healthcare providers (HCPs) are repeatedly exposed to patient suffering and related traumatic events in their work.[1-4] Interoceptive awareness (heightened attention and listening to bodily sensations that arise in response to external and internal physical events and in response to emotions and thoughts)[5] is a documented result of meditation and a possible mechanism of some of meditations' beneficial outcomes.[6,7] Although research on the potential of meditation to reduce HCP stress and improve CF and burnout suggests benefits, too often, the studies are based on prohibitively time-intensive interventions. Furthermore, the interventions studied often combine disparate meditation practices with other kinds of mindfulness exercises and cognitive training,[8,9] obscuring understanding of which components contribute to the observed outcomes.

This pilot study examined acceptability and outcomes of an innovative 6-week technology-assisted meditation program for hospice and palliative HCPs. The program was designed to require minimal HCP time. Smartphone

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apps were used to deliver 10- to 12-minute meditations. Personalized e-mails introduced a new meditation app each week, explained how and why to do it, and encouraged HCPs to do the meditation once per day throughout the week.

The meditations and e-mail messages were coherently grounded in the Krishnamacharya-Desikachar approach to yoga for healing known as yoga therapy (YT).[10-12] Most people understand yoga in the context of group yoga classes. Yoga therapists work with individual clients, or sometimes with small groups who share a common symptom, to empower them "to progress toward improved health and well-being through the application of the teachings and practices of yoga."[13] Highly trained yoga therapists[14] develop a short, custom, personal practice for the client to do every day. The personal practice may include physical movements, breath control, and meditation.

The YT meditations in this study were tailored to address the work stressors of hospice and palliative care HCPs. The meditations were designed not only to be effective in changing the state of the human system in a desired direction but also to be accessible to individuals who are new to yoga and meditation and those with limited strength and flexibility.[15] The YT meditation apps were intended to be used while seated in a chair with eyes closed. All 5 meditations involve synchronizing gentle movements with inhale and exhale. This activates interoception and gives the mind something to do, quickly relaxing the body and quieting the mind. Calming, the first of the 5 meditations, is the simplest. Later meditations add new elements as program participants become familiar with how to do the YT meditations and, through repeated practice, begin to build their breath and attentional capacities.[15]

A key question was whether the technology-assisted YT meditation program motivated HCPs to meditate regularly. The research also tested the hypothesis that the short but focused technology-assisted YT meditation program could reduce HCP CF and burnout. A second hypothesis predicted increased attention to and usage of interoception in daily life (interoceptive awareness).

CF and Burnout

Nurses, physicians, and other HCPs who observe suffering and provide care for severely ill patients are at high risk of developing CF and burnout.[16] Compassion fatigue, a perception of malaise and psychic exhaustion, occurs in reaction to ongoing relationships with patients who are experiencing trauma.[16,17] Compassion fatigue often co-occurs and exacerbates symptoms of burnout, a distinct but similar concept reflecting diminished interest and work exhaustion.[18] Compromising health, psychological CF symptoms include numbness and inability to feel, hopelessness, anxiety, depression, anger, cognitive issues such as poor concentration and judgment, and intrusive aversive thoughts.[19-21] Physical CF symptoms include fatigue, gastrointestinal problems, muscle tension, headache, and sleep disturbances.[19,22] Workplace CF symptoms include decreased productivity, high absenteeism, decreased work engagement, and lack of empathy and avoidance in working with specific patients.[19,23] Other negative outcomes include medical errors, increased turnover, and decreased patient safety and patient/family satisfaction.[18,19,24]

Meditation and HCPs

Concern about the prevalent threat of CF and burnout to HCPs has sparked research interest in meditation as a means of reducing risk or improving symptoms. Meditation and mind-body therapy studies have documented reduction in perceived anxiety, depressive symptoms, and burnout and increased compassion in clinicians[4,25] as well as reduced anxiety and burnout in physicians.[2] Kabat-Zinn's[26] mindfulness-based stress reduction (MBSR) program is the most studied intervention for HCPs. In a literature review of 13 studies incorporating MBSR training for nurses/students, benefits included reduced stress, decreased burnout and anxiety, and improved focus, empathy, and mood.[3]

Problems of Unclear Mechanisms With MBSR

The MBSR combines didactic group instruction with diverse mindfulness practices and stress reduction exercises.[8,26] This amalgam (which includes instruction, group interactions, and informal practices that are not meditation) yields beneficial effects. A major weakness of MBSR research is that it cannot distinguish which elements of the training and practices are responsible for observed beneficial changes.[8,27,28]

Meditation

Meditative practices often involve focusing attention toward specific interoceptive sensations, such as the breath.[6,29,30] Meditative practices are purposeful strategies that build attentional capacity and interoceptive awareness.[6,31] Regular meditation practice strengthens the "attentional spotlight," directing attention to immediate bodily sensations including feelings (interoception).[5,6,31] By focusing attention on interoception, meditation suppresses mind wandering, dispersing ruminations and worry about the past or future.

Interoceptive Awareness

Directing attention to interoception can relieve stress and cultivate self-regulation, improved focus, quality of attention, and authentic presence and may hypothetically modify the risk for and relieve symptoms of CF and burnout.[32-35] Interoception refers to "the process of receiving, accessing, and appraising internal bodily signals"[6]

including awareness of temperature, pain, and touch. Furthermore, interoception includes bodily sensations associated with perceptions, emotions, intentions, and thoughts.[5,6,36] Interoception is also a process of attending to and then acting in the world informed by this physical and emotional information.[5]

Embodied presence occurs when the mind integrates attention to embodied feelings with other present-moment bodily sensations to produce a heightened awareness of the moment and of sense of self.[5,36] Through frequent repetition, meditation brings about neuroplastic changes in brain structure and function that directly strengthen attention to present moment experience.[30] Neurological studies of frequent meditators show that regular practice increases activation of neural networks associated with interoception, bringing interoception forward into daily life[30] to play a central role in affect regulation, decision making, and embodied sense of self.[5,36,37]

Time Demands of MBSR Training

Traditional research approaches to introducing HCPs to meditation carry often untenable time demands. The MBSR training includes 20 to 27 hours of in-person group training and 30 to 45 minutes of daily individual home practice over 8 weeks.[38,39] Isolated trials of shorter variations such as 4 weeks instead of 8,[40] in person plus telephone,[41] and a single 1-day workshop[1] have yielded significant outcomes but still demand considerable HCP time. The HCP study participants complained that time demands of participating in MBSR stress reduction programs increased their stress. Studies encounter HCP high attrition rates from lengthy programs because of inflexible scheduling and intense time demands.[3,9]

Time Demands of the YT Meditation Program

Given the problems associated with MBSR time and scheduling demands, our 6-week technology-assisted YT meditation program was designed to fit into busy HCP lives. Synchronous in-person or online MBSR training was replaced by short, automated, personalized e-mail messages sent twice weekly from the yoga therapist who guided the meditations. Instead of 45-minute MBSR home practices, the YT meditation program offered 10- to 12-minute YT meditations delivered and tracked by smartphone apps that could be used at any convenient time and location.

The study purpose was to examine the acceptability and preliminary efficacy of a novel 6-week technology-assisted YT meditation program that required minimal HCP time. Our research question was to determine to what extent the HCPs used the meditation apps throughout the 6-week period. Two study hypotheses included that (1) HCP participation in the technology-assisted YT meditation program would result in improvements in CF and burnout and (2) HCP participation in the technology-assisted YT meditation program would result in increased attention to and usage of interoception in daily life (interoceptive awareness).

METHODS

The YT meditation program was offered to hospice and palliative HCPs at a large Midwestern healthcare network. The apps tracked meditation usage. Presurvey and postsurvey were administered to assess outcomes and test the hypotheses.

Intervention Description

The 6-week technology-assisted YT meditation program used smartphone apps to deliver five 10- to 12-minute meditations (1 per week for the first 5 weeks) with twice weekly automated, personalized e-mail messages. In the sixth week, the participants could choose any 1 of the 5 meditations each day. The meditations and messages were developed for this study by a yoga therapist who is an expert in YT meditation working with a user-experience designer who studies YT meditation. The intervention development was iterated over a 3-year evaluation cycle to create a program that was short, accessible, and effective. Specifically, YT meditation expert Marcel Allbritton's expertise included extensive YT training in both in the United States and India along with 10 years of clinical YT practice.

The YT meditation program used a new meditation each week to provide variety and novelty and help motivate continued regular practice. All 5 meditations (calming, place in nature, nourishing, releasing, and spaciousness) used the same general approach to movement, breathing, and attention and therefore had similar effects on body, breath, and mind. Each meditation also included a unique focus. The sequence began with the simplest meditation (calming) in week 1. Next was the nature meditation that involved connecting with the feeling of being in a favorite place in nature. Most people find it easy to remember the feeling of being in a favorite place in nature. The final 3 meditations (nourishing, releasing, and spaciousness) were more abstract. Each individual HCP is likely to respond more strongly to certain of the meditations than to others, depending on their personality, their previous experience with the feelings that the meditation taps into, and the state of their system when they do the meditation. The nourishing meditation may help you feel less bothered by things, less reactive, more nourished. Releasing may help release what you are holding onto that you no longer need. Spaciousness may help you cultivate a sense of space felt inside of yourself and in your interactions so you can be calmer, more balanced, and more present.[15]

Each meditation integrated breathing, gentle movements, and mental focus to reduce stress, connect with

positive feelings, and promote interoceptive awareness. Attention to breathing, bodily sensations, and movement activates interoceptive awareness, helps relax the body, and develops attention regulation capacity.[11,12,42] Table 1 shows the specific movements, breathing, and mental focus included in each meditation.[15] The original YT meditations used in this study have been revised, incorporating HCP feedback from the research, and are now combined into a single app, RelaxU (Mindtoon Lab, San Francisco, California). The Figure shows a screenshot of the RelaxU home screen. RelaxU is available for free on the Apple App Store and Google Play. To download RelaxU, search the appropriate app store for Mindtoon Lab (that is TOON as in carTOON, not TUNE as in "play that TUNE"). Then scroll down to RelaxU.

E-mails were a critical component of the technology-assisted YT meditation program. In YT, the relationship

TABLE 1 Components of the 5 YT Meditation Apps

Meditations	Calming	Nature	Nourishing	Releasing	Space
Movements and postures					
Upright seated in chair, eyes closed	✓	✓	✓	✓	✓
Arm extension up in front	✓	✓	✓	✓	✓
Arms up from front then out to side				✓	
Arm extension up in front, alternating arms	✓		✓		✓
Arm extension from chest down to side	✓				
Arm extension out from chest	✓	✓	✓	✓	
Arm extension up in front, palms facing body			✓		
Seated forward bend				✓	
Move hands over thighs toward knees	✓			✓	
Bring fingers in to thumb					✓
Breathing or inspiratory-expiratory ratio					
Free observed breath	✓	✓	✓	✓	✓
Extend exhale	✓			✓	
Pause after exhale	✓				✓
Focus on feeling of nourishment on inhale			✓		
Focus on the felt quality of space in exhale					✓
Meditation objects					
Notice bodily sensations	✓	✓	✓	✓	✓
Notice level of mental activity	✓	✓	✓	✓	✓
Think of favorite place in nature		✓			
Bring feeling of favorite place inside		✓			
Feel self in favorite place in nature		✓			
Feel nourishment of breath and attention			✓		
Bring nourishment inside					
Release what you no longer need				✓	
Feel space inside					✓

FIGURE. RelaxU home screen.

between the yoga therapist and the client motivates regular practice, helps the client understand how and why to do their practice, and helps the client notice changes in themselves over time. The YT meditation program used personalized e-mail to simulate some of the experience of the yoga therapist-client relationship. An initial e-mail introduced the meditation for that week, explained how or why to do the meditation, and urged the HCPs to do the meditation once per day throughout the week. The follow up e-mail each week reinforced that week's teaching about how or why to do the meditation and reminded participants of the importance of doing the meditation once a day.

E-mail explanations guided the participants to recognize global principles and practices that were common across all the meditations and to deepen their experiential understanding over time. For example, in all the YT meditations, when participants were guided to do a movement, they were instructed to align the movement with breathing. The meditation guide often said "To begin, have your arms down by your sides. As you inhale, raise your arms up from the front toward the ceiling. Then as you exhale, lower your arms down." Week 1 e-mails talked about "aligning the movement with the breath." In the week 2 e-mails, after the participants had been experiencing the meditations for a week, a more refined explanation was offered: "When the breath starts, the movement starts. When the breath ends, the movement ends."

Meditation Frequency Data

Meditation frequency was measured by analysis of automatic meditation app use tracking data and postsurvey self-reports of meditation app usage. Because of technical issues during data collection (such as lack of data when the apps were used but devices were not connected to the Internet and inability to combine usage counts for those who sometimes used the apps on their smartphone and other times used an iPad or tablet), the final app tracking data was an undercount of actual app usage. Therefore, self-report and app tracking data were compared. Because the automatic tracking data was known to be an undercount of actual usage, the higher of the 2 values for each study participant was used.

Instruments

Stamm's[43] professional quality of life (ProQOL) instrument includes 10-item subscales for CF and burnout based on 5 response categories (1, never, to 5, very often). Numerous studies have confirmed ProQOL instrument's construct validity and reliability.[16,44] Cronbach α values were 0.75 and 0.73 in this study.

The Multidimensional Assessment of Interoceptive Awareness (MAIA) instrument[45] was developed to measure beneficial dimensions of interoceptive attention and to aid in understanding the effects of interoceptive training such as the YT technology-assisted meditation.[37,46,47] The MAIA scale was developed with careful attention to construct validity, which was then confirmed through comparison with related measures and examination of differences across known groups.[37] Subsequent research using this scale has shown strong convergent and divergent scale validity.[37] The MAIA subscales range from 3 to 7 items with 6 response categories (0, never, to 5, always).[45] The current study compared presurvey and postsurvey subscales most related to the YT meditation foci. These subscales include attention regulation (ability to sustain/control attention to bodily sensations), emotional awareness (awareness of bodily sensations' connections to emotions), self-regulation (ability to regulate distress by attention to bodily sensations), noticing (awareness of bodily sensations), body listening (tendency to actively listen to the body for insights), and body trusting (experiencing one's body as safe and trustworthy). The 2 other MAIA subscales (not distracting and not worrying) measure not ignoring and worrying about feelings of pain or discomfort. Because of time constraints and the focus of 10-minute meditations on meditation objects, these dimensions were not targeted in the technology-assisted meditation. Therefore, not worrying and not distracting were not part of expected outcomes. Cronbach α values

ranged from 0.83 to 0.94 for the 6 subscales that are a part of this study.

RESULTS

Sample

A total of 93 hospice and palliative care HCPs at a large Midwestern US health network were invited via e-mail to register for the technology-assisted meditation program. After institutional review board approval through the respective university and healthcare network, the participants registered via a privacy- and identity-protected system. Incremental study compensation was provided based on extent of participation.

Of the 44 HCPs who registered online to participate, 82% (n = 36) downloaded at least one app. About one third (31%) were palliative care employees and 69% worked in hospice. The participants were primarily women (n = 35), consistent with the predominantly female composition of the staff. Ages ranged from 28 to 80 years, with an average of 49 (SD, 11) years. By role, 39% were nurses; 14%, managers from the respective home hospice and palliative care units; 11%, physicians; 8%, clerical; 6%, aides; 6%, social workers; and 17%, other. Of the participants, 50% had never meditated, 25% had some past exposure, and 25% meditated within the last month.

The CF and burnout scores on the ProQOL instrument can range from 0 to 115. On these 2 subscales, scores below 26 are considered very low; 27 to 30, low; 31 to 35, neutral; 36 to 40, high; and greater than 41, very high.[43] Although hospice and palliative care workers are at high risk for CF and burnout, in this sample, 81% of the participants had very low CF baseline scores; 14%, low; and 5%, neutral. For burnout, the baseline scores of the study participants were 94% very low, 3% low, and 3% neutral.

Meditation Frequency

Of the 36 study participants who downloaded and registered at least 1 app, almost all (93%) meditated once or more per week for at least 5 weeks. The average meditation frequency was 2.9 times per week. The number of times that the participants used a meditation app over the 6-week program varied widely, ranging from a low of 4 times to a high of 33 times with a mean of 17.18 (SD, 8.69). Use of the apps was persistent throughout the program but less frequent than the recommendation of daily use, which would have totaled 42 times over 6 weeks. The answer to the research question about the extent of meditation use by HCPs is that the YT meditation program motivated participants to use the meditation apps regularly across the study period. Frequency of use ranged from once per week to 6 times per week.

CF and Burnout Comparisons

Although baseline CF and burnout scores of the HCPs in the study were low to begin with, scores were significantly lower after participation in the YT meditation program (Table 2). Thus, the hypothesis that exposure to the technology-assisted YT meditation program would result in reductions in CF and burnout is supported.

Interoceptive Awareness Comparisons

Interoceptive awareness scores, as measured by the MAIA subscales (attention regulation, emotional awareness, self-regulation, body listening, and body trusting), are provided. Table 3 presents means, SDs, and paired *t* test statistics for prestudy and poststudy participation.

Attention regulation, emotional awareness, self-regulation, noticing bodily sensations, and body listening subscale scores showed significant improvement after participation in the program (Table 3). One case was omitted from the body trusting mean comparisons because of an extreme outlier score. After removal, preparticipation and postparticipation scores were normally distributed, as assessed by Shapiro-Wilk test ($P = .058$). Scores on the body trusting subscale after study participation were also significantly higher after participation in the program.

Table 3 shows that MAIA subscale poststudy scores were not simply better, they were also notably high, with the mean reaching 4.5 of a possible 5 on 3 of the subscales (emotional awareness, noticing, and body trusting). Because of the significant improvements noted on all 6 dimensions of MAIA, support for the second hypothesis that is "gains in interoceptive awareness would be achieved" were demonstrated.

DISCUSSION

The YT technology-assisted meditation program's combination of smartphone apps and messaging was successful

TABLE 2 Presurvey and Postsurvey Paired *t* Tests for CF and Burnout

	Presurvey		Postsurvey			95% CI					
ProQOL	M	SD	M	SD	Delta M	Low	High	*df*	*t*	*P*	*d*
CF	21.34	4.14	20.00	5.02	1.34	−2.57	−0.12	34	2.209	.034	.37
Burnout	22.22	4.52	20.64	5.00	1.58	0.03	3.14	35	2.062	.047	.34

Abbreviations: CF, compassion fatigue; CI, confidence interval; ProQOL, professional quality of life.

TABLE 3 Presurvey and Postsurvey Paired *t* Tests for MAIA

MAIA subscales	Presurvey		Postsurvey			95% CI				
	M	SD	M	SD	Delta M	Low	High	*df*	*t*	*P*	*d*
Attention regulation	2.32	1.15	3.67	0.87	1.34	1.67	1.00	30	8.043	.001	1.44
Emotional awareness	3.07	1.11	4.51	0.71	1.44	1.74	1.14	35	9.683	.001	1.59
Self-regulation	2.57	1.02	4.17	0.69	1.60	1.88	1.31	33	11.493	.001	1.97
Noticing	3.13	0.97	4.51	0.77	1.38	1.68	1.08	35	9.302	.001	1.55
Body listening	1.78	1.26	3.57	0.95	1.78	2.10	1.45	33	11.532	.001	1.68
Body trusting	2.78	1.17	4.48	0.84	1.69	2.07	1.32	35	9.272	.001	1.91

Abbreviations: CI, confidence interval; MAIA, multidimensional assessment of interoceptive awareness.

in motivating ongoing meditation practice throughout the 6-week study period. The average meditation frequency was approximately 3 times per week. Despite the lower-than-the-suggested daily frequency of meditation, this level of consistent engagement seemed to be sufficient to bring about improvements in interoceptive awareness, CF, and burnout. These findings suggest that on average meditating 3 to 5 times per week was sufficient to elicit desired changes. It is not clear whether urging participants to meditate once daily was necessary to motivate the observed meditation frequency or if recommending 3 to 5 times per week would result in the same amount of meditation. Furthermore, different individuals may benefit from different frequency of meditation. Future research could test these questions.

The participation in the program resulted in improvements in CF and burnout even though prestudy levels were already low. The technology-assisted YT meditation program was a viable way to introduce HCPs to meditation with a goal of supporting ProQOL. Larger improvements might be found in HCP populations with higher initial levels of CF and burnout.

The study's research question was to determine whether an approach that combined YT meditation apps with motivational YT e-mails could succeed in inspiring HCPs to engage in prescribed meditations. Unlike MBSR, the YT meditation program tested in this study did not require group or individual conversations with teachers and, compared with MBSR, took a small fraction of HCP time. It is recognized that MBSR requires 22 to 27 hours of in-person group training. In contrast, with the program described in this study, it would take less than 1 hour for the YT participant to read the combined total of the 12 e-mails that were delivered over 6 weeks. The established MBSR program also requires dramatically more meditation time than the YT meditation program. If an MBSR participant did the assigned 45-minute home practice every day, this would tally up to 42 hours over 8 weeks. If the participants of this study did the 10-minute meditation every day at least once, YT meditations would take less than 8 hours over 6 weeks. Comparatively, YT meditation practice time takes 18% of MBSR home practice time and 4% of MBSR training time.

Each week, the participants repeatedly experienced 1 of 5 different meditations in which they directed attention specifically to bodily sensations, breath, movement, and feelings associated with a meditation object. These YT meditation experiences seemed to succeed in opening a window to interoception that participants carried forward into daily life.

Many benefits of YT meditation are closely aligned with the dimensions of interoception measured by the MAIA. The YT meditations included attention to moving only as far as was comfortable; noticing the state of one's body, breath, and mind; and focusing on feelings and emotions such as being in one's favorite place in nature or how it feels when you feel nourished. The YT meditations

and e-mail messages were highly effective at increasing 6 dimensions of participants' interoceptive awareness. Prestudy to postintervention levels showed significant increases. These changes are consistent with the kinds of changes in self-regulation and emotional awareness that yoga therapists typically observe occurring in their clients as the client engages in a customized personal daily YT practice.[11,48]

It seems from this study that using smartphone and e-mail technology to provide a 6-week introduction to YT meditation can be viable. However, it is important to recognize that meditation teachers and practitioners meditate daily, over a lifetime. The effects of a long-term meditation practice mature and change over time. The HCPs in the present study seem to have experienced early initial benefits. The program seemed to affect many dimensions of interoceptive awareness in a short period. Follow-up programs could focus on maintaining gains, motivating ongoing practice, and elaborating a focus on long-term outcomes.

Limitations

The study is limited by a small convenience sample of hospice and palliative care HCPs. Only 40% of the invited sample population registered to participate and downloaded an app so it is important to acknowledge that the identified gains might not be replicated in a non-self-selected group. We were not able to ascertain reasons for nonparticipation, which may have included lack of time and lack of interest, and whether lack of access to or comfort with the required technology hindered the willingness of some in the targeted group to engage in the study. In future studies, it will be important to determine the factors that impede or facilitate willingness to engage in a technology-assisted YT meditation program that may potentially improve response to work-related stressors.

The low prestudy CF and burnout scores suggest that the study sample may have already been engaging in strategies to cope with the trauma associated with caring for people facing the end of life. Hospice and palliative care HCPs are consistently exposed to patient suffering and death and, as a unit, are aware of the need for HCP self-care. It is important to recognize that there could be characteristics of hospice and palliative HCPs that are different from other groups. Furthermore, the study is limited by a reliance on self-report measures. Physiological measures could contribute to better understanding study effects. To deepen understanding of mechanisms of effect, future research should include a randomized trial with an active control group.

CONCLUSION

As an accommodating flexible strategy to support hospice and palliative care HCPs who experience work-related stressors, the technology-assisted YT meditation program's combination of smartphone app meditations and e-mail messaging was found to be both acceptable and beneficial to self-selected participants. Meditation apps are inexpensive or free to users and can be flexibly tailored to HCPs who have busy lives and competing time demands. As healthcare environments become more complex and challenging, it becomes increasingly imperative that a range of cost-effective supportive resources are available for HCPs to improve ProQOL, support retention, and offset CF and burnout. A larger sample size and different populations of HCPs with significant prestudy levels of CF could potentially challenge either positively or negatively the pilot study findings.

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