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Original Research

The Impact of Mindful Meditation on Health Care Workers During the COVID-19 Pandemic

Kimberly Prado, Akeelah Robinson, Ying-Yu Chao

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A B S T R A C T

Background: The COVID-19 pandemic placed a spotlight on health care workers as the world struggled with mental health crises. As the number of COVID-19 cases rose exponentially, this also paralleled health care workers' perceived stress burden and increased risk for mental health trauma. This research project assessed the impact of a mobile mindful meditation application on health care workers' perceived stress levels during a pandemic.

Methodology: Through quasi-experimental design, researchers assessed the effect of using a mobile mindful meditation (Synctuition) app on health care workers' stress levels. Participants listened for 20 to 30 minutes daily for 30 days. Participants perceived stress levels were measured with Cohen's Perceived Stress Scale.

Results: Of the 100 participants, there was a statistically significant decrease in perceived stress reduction between the groups across various categories. The pretest perceived stress scores were reduced from moderate to low stress postintervention after using the mindful meditation application.

Implications for Practice: Reducing stress in health care workers can potentially increase the quality of life for health care workers. and lowering stress levels can potentially improve the quality of care provided.

Background

As the world struggles with mental health crises, the COVID-19 pandemic placed a spotlight on health care workers. Health care workers were deemed heroes by the general population, and their bravery and resilience were publicly observed by many. Yet despite their heroic status, health care personnel quietly faced mental trauma occasioned by situations they could never have imagined. As the number of COVID-19 cases rose exponentially, staffing levels were reduced throughout health care organizations as colleagues caught the virus. Constant exposure to the virus, especially when coping with minimal access to personal protective equipment, led health care workers to fear contracting the virus and spreading the disease to those they cared for. Many chose isolation to prevent spreading the virus to their families. This choice further increased the health care workers' perceived stress burden and increased their risk for mental health trauma. Consistent, high-stress levels had a negative impact on health care workers' physical and mental health worldwide, which led to anxiety, depression, sleep disturbances, substance abuse, disruption in personal relationships, and even suicide.[1,2]

Multiple studies have suggested that mindful meditation beneficially reduces stress levels, especially among those who practice it over time.[3-8] Given its powerful benefits, many providers have become intrigued by the practice. Most providers believe mindful meditation to be a valuable skill with psychological and biological benefits. For these reasons, mindfulness has been incorporated into coursework required by medical curricula.[9] A few providers have expressed caution due in part to the concern that some participants react differently to mindful meditation intervention.[10] In a cross-sectional survey, Schlosser et al showed that 25% of participants who regularly participated in mindful meditation reported increased negative self-talk when trying to meditate in a quiet environment.[11] During this quiet environment, participants, attempting to calm their minds, would instead find their minds racing with the events that transpired during their busy day or the tasks at hand that still needed to be completed by the day's end, making it difficult to relax. During these moments, the mindful meditation increased the participants' stress levels because individuals were more self-aware of their negative emotions.

On further review, there appeared to be a gap in the literature on mobile mindful meditation applications within the population of health care workers laboring under a worldwide pandemic. A clinical question has arisen as to whether mobile mindful meditation applications impact perceived stress reduction among health care workers during the worldwide COVID-19 pandemic.

Methodology

Innovative application of binaural beats appears to be a solution because this mechanism facilitates the reduction of stress. Binaural beats exist when two or more pure tones are projected dichotically through headphones. McConnell et al revealed in their landmark double-blind placebo study that participants who listened to the

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binaural beat technology for 20 minutes daily reported a greater sense of relaxation.[12]

Through quasi-experimental design, researchers assessed the effect of using a mobile mindful meditation application on health care workers' perceived stress levels. Health care workers included in the study: physicians, advanced practice nurses, physician assistants, nurses, therapists, medical technologists, and medical assistants. These participants accessed the study via a QR code on a recruitment flyer and were eligible to proceed with the study if they agreed with consent and met the inclusion criteria (18 years or older, English as a primary language, and the participant worked in the role of a health care worker). The study used a mobile application program (Synctuition), an advanced audio mindful meditation app that transported the participant on a 20- to 30-minute 3D audio journey to relaxation for 30 days, using the binaural beats technology combined with sounds and frequencies that relax the mind. The sounds are recorded live in nature providing the listener with the sensation that they are immersed within the environment.

The participants' perceived stress levels were measured with Cohen's Perceived Stress Scale (PSS-10), pre- and post-intervention during the COVID-19 crisis. The PSS-10 tool measures the degree to which situations in someone's life were deemed stressful.[13] The 10 questions on the scale identify the unpredictability, uncontrollable and overloaded perceptions in the participant's lives.[13] Participants were asked to respond to each question on a 5-point Likert scale ranging from 0 (*never*) to 5 (*very often*). The total score was calculated after adding each question's score. Participants' total PSS-10 scores ranged from 0 to 40. Scores ranging from 0 to 13 would be considered low stress. Scores ranging from 14 to 26 would be considered moderate stress. Scores ranging from 27 to 40 would be considered high perceived stress. Cohen's Perceived Stress scale tool was chosen for the study based on the benefits of being user-friendly for the participant, easy to comprehend, designed for use in community samples, and, most importantly, the PSS-10 tool possessed validity and internal reliability (alpha coefficient = .78).[13]

Data Analysis

Data were analyzed with descriptive and inferential statistics. Descriptive statistics were used to show the demographic data of the participants' age range, gender, and role. Data from PSS-10 was not normally distributed after checking with Kolmogorov–Smirnov test. Hence, a nonparametric test, the Wilcoxon signed rank test, was used to compare the difference of PSS-10 before and after the intervention of the mindful meditation and then assessed statistical significance.

Results

Data collected revealed that of the 106 participants who completed the pretest, 100 completed the posttest. Six were lost to follow-up (6 participants failed to follow up and finish the posttest PSS-10 questionnaire and were removed from the study). Hence, 100 participants were included in the final data analysis.

Of the 100 participants, 86% of participants were female and 13% of participants were male. In terms of role, 12% of the participants were physicians, 5% of participants were nurse practitioners, 3% of participants were physician assistants, 33% of participants were nurses, 6% were therapists, 15% of participants were medical assistants, 7% of participants were technologists, and 18% of participants answered other for the role. Regarding age, 63% of participants were aged 18 to 40 years, 27% of participants 41 to 56 years, and 9% of participants 57 to 89 years (Table 1).

Table 1
Participants Characteristics (N = 100)

	Frequency (%)
Gender	
Male	13
Female	86
Prefer not to say	1
Age	
18–25	8
26–33	26
34–40	29
41–48	14
49–56	13
57–64	7
65–89	2
Not answer	1
Roles	
Physicians	12
Advanced nurse practitioners	5
Physician assistants	3
Nurses	33
Therapists	6
Medical assistants	15
Technologists	7
Others	18
Prefer not to say	1

Overall, participants had a significant decreased perceived stress from 19.46 ± 6.14 at pretest to 5.79 ± 6.93 at posttest ($P < .001$). Specifically, stress scale scores (PSS-10) were analyzed for each category—gender, age, and role. For gender, males had a significant decreased perceived stress from 20.15 ± 4.08 at pretest to 4.62 ± 5.61 at posttest ($P < .01$). Females also had a significant decreased perceived stress from 19.41 ± 6.42 at pretest to 5.94 ± 7.16 at posttest ($P < .001$). For age, there were statistically significant differences in PSS-10 between pretest and posttest among the youngest (18–40 years, $P < .001$), middle-aged (41–56 years, $P < .001$), and older (57–89 years, $P < .05$) participants. For roles, there was a statistically significant decrease of PSS-10 from pretest to posttest among physicians, advanced practice nurses, and physician assistants ($P < .001$), registered nurses/therapists ($P < .001$), medical assistants/technicians ($P < .001$), and Other ($P < .001$) (Table 2).

Discussion

All groups showed a statistically significant stress reduction after using the Synctuition mindful meditation application, based on the pre- and postintervention perceived stress tool.

Table 2
Difference of Perceived Stress Between Pretest and Posttest (N = 100)

	Perceived Stress		*P* value
	Pretest (M ± SD)	Posttest (M ± SD)	
Gender			
Male (n = 13)	20.15 ± 4.08	4.62 ± 5.61	0.001
Female (n = 86)	19.41 ± 6.42	5.94 ± 7.16	<.001
Age			
18–40 (n = 63)	21.50 ± 4.91	6.02 ± 6.98	<.001
41–56 (n = 27)	18.91 ± 6.61	5.02 ± 6.83	<.001
57–89 (n = 9)	15.36 ± 5.97	7.29 ± 7.54	0.17
Roles			
MD/APN/PA (n = 18)	16.87 ± 6.85	5.09 ± 6.36	<.001
Nurses/therapists (n = 39)	19.81 ± 5.26	4.92 ± 6.22	<.001
Medical assistants/technologists (n = 22)	22.38 ± 7.41	7.06 ± 8.25	<.001
Others (n = 18)	19.05 ± 5.14	6.95 ± 7.74	<.001

APN = advanced practice nurse; MD = medical doctor; PA = physician assistant.

Descriptive statistics revealed that all participants' mean pretest perceived stress scores were reduced from moderate to low stress postintervention. There was a statistically significant difference in stress reduction between the preintervention and postintervention groups across various categories: medical assistants, technologists, and the youngest participants reported the highest preintervention perceived stress scores. Health care providers, physicians, advanced practice nurses, and physician assistants, and the oldest participants reported lower preintervention perceived stress scores compared to their younger counterparts.

Implications

Mobile mindful meditation applications should be used by health care workers to reduce stress, especially given that all subgroups showed a statistically significant stress reduction after using the Synctuition mindful meditation app. The Synctuition app significantly reduced health care workers' perceived stress during the COVID-19 pandemic and thus had a positive impact. Synctuition was able to refocus the racing mind to a calming state within a 3D journey with binaural beat technology. This refocus of the mind was successful even for participants who had difficulty with traditional approaches to mindful meditation. Importantly, these participants were able to relax.

The Synctuition mindful meditation experience was unique and different from other traditional mindful meditation programs because it successfully refocuses the mind to the present. Participants listen to the 3D beautiful and relaxing sounds and frequencies that have been known to relax the mind combined with the binaural technology, which immerses the listener in an explorative journey. By exposure to these sounds, participants are provided with positive affirmations that prevent and redirect those prone to self-negative talk.

A few participants commented that this mindful meditation program provided a more restful sleep than traditional methods. Accordingly, future studies should be undertaken to further assess the quality of sleep following mindful meditation intervention.

Relaxation and restful sleep are crucial for health care workers, especially during a pandemic, and can enhance peak brain performance in a fast-paced world. Reducing stress in health care workers can potentially increase the quality of life not only for the health care workers but also for the quality of care provided.

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Kimberly Prado, DNP, AGPCNP-BC, is an assistant professor at Rutgers University School of Nursing, Newark, NJ, and can be contacted at kimberly.prado@Rutgers.edu. Akeelah Robinson, DNP, FNP-BC, is an alumni from Rutgers University School of Nursing, Newark, NJ Ying-Yu Chao, Ph.D, GNP-BC, is an assistant professor at Rutgers University School of Nursing, Newark, NJ.

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