BRIEF REPORT



The Development, Implementation, and Preliminary Outcomes of a 5-Minute Mindfulness Program to Improve Well-Being and Increase Connection Across a University Campus

Chloe A. Nicksic Sigmon¹ · Dina Bam¹,² · Erika Moldow¹ · Sarah Beary¹,² · Katie Wakefield¹ · Debra L. Boeldt¹

Received: 27 March 2021 / Revised: 25 September 2021 / Accepted: 22 October 2021 / Published online: 10 November 2021 © The Author(s), under exclusive licence to Springer Nature Switzerland AG 2021

Abstract

Background In response to the COVID-19 pandemic, people worldwide have experienced increased anxiety, depression, and loneliness and decreased well-being. Mindfulness has been shown to enhance well-being across a variety of settings and for a variety of populations.

Purpose We developed and implemented a digital mindfulness program called Mindful Moment across a US university system as an innovative wellness resource to facilitate well-being and sense of connection among faculty, staff, and students. Attendees engaged in 5-minute live guided mindfulness sessions twice per week. This paper outlines our program evaluation over the course of four months.

Methods A total of 236 individuals attended between one to 30 mindful moment sessions. Data were collected on attendance, perception of the program's impact on attendee well-being and connectedness to the community, and feedback for future program development. Data collection included standardized stress and belongingness measures in addition to qualitative data related to perceived impact and reasons for attending.

Results Students, faculty, and staff who attended Mindful Moment and completed surveys reported that the program was easy to access, noted immediate benefits including decreased stress and improved well-being, and some attendees reported increased feelings of connection with the community.

Conclusions The present paper is exploratory in nature, a first step to assessing feasibility and overall impact. Future research assessing the impact of digital mindfulness programs can be improved by including a comparison group, additional standardized assessment, and a pre-post design, allowing for stronger conclusions to be drawn regarding efficacy and generalizability.

Keywords Mindfulness · COVID-19 · Well-being · Connection · Community · Digital wellness

The spread of COVID-19 has been a threatening and omnipresent hazard since early 2020, when it was declared a pandemic. Many consequences of the pandemic (e.g., social distancing, isolation, uncertainty, fear, etc.) have been linked to increased stress-related symptoms and negative effects on mental well-being (Duan & Zhu, 2020; Satici et al., 2020). As the pandemic drags on, the prolonged isolation and

drastic changes to daily life have further contributed to poor mental health, specifically posttraumatic stress symptoms, avoidance behaviors, and anger (Galea et al., 2020; Riva & Wiederhold, 2020).

As a result of stay-at-home orders to minimize the spread of COVID-19, more than 35% of Americans were shifted from in-person to remote work environments and asked to leave the house only for essential purposes (Gould & Shierholz, 2020). Although it may come with many perks (e.g., no commute), emerging research has provided evidence of the downsides of remote work. Remote workers experience an increase in the number of hours worked per day, are at increased risk for burnout, and are at risk of potential loss in productivity (Tovmasyan & Minasyan, 2020). The changes in work and living conditions resulting from the pandemic have also impacted social well-being. A



Chloe A. Nicksic Sigmon chloe.nicksicsigmon@cuanschutz.edu

National Mental Health Innovation Center, University of Colorado Anschutz Medical Campus, 13001 E. 17th Place, Suite W5130, CO 80045 Aurora, USA

Colorado School of Public Health, Anschutz Medical Campus, Aurora, USA

national survey conducted in Australia found that feelings of loneliness due to isolation was identified as the most common personal stressor during the pandemic (Smith & Lim, 2020). The psychological fallout of the COVID-19 pandemic highlights the need for low-cost, scalable, and readily deployable solutions to help the world's population address declines in well-being. Mindfulness represents one such solution.

Mindfulness involves focusing one's attention on the present moment on purpose, while taking a nonjudgmental stance (Kabat-Zinn, 2003). It has been extensively researched as a method for coping with psychological distress and has been linked to many positive outcomes, including significant improvements in mood, positive affect, and well-being (Bowden et al., 2012; Brown et al., 2009; Carmody & Baer, 2008; Davis & Hayes, 2011; Eberth & Sedlmeier, 2012; Hanley et al., 2015; Keng et al., 2011; Kong et al., 2014). Research examining a wide range of industries and occupations also supports work-related benefits of mindfulness (Lomas et al., 2017). Mindfulness has been linked to employee well-being and healthy worklife balance (Allen & Kiburz, 2012; Michel et al., 2014; Mitmansgruber et al., 2008; Roche et al., 2014; Schultz et al., 2014) in addition to job satisfaction (Hülsheger et al., 2013) and professional quality of life (Duchemin et al., 2015).

Mindfulness practiced in a group environment may have added benefits. Mindfulness originated in spiritual traditions, in which the group and community context was integral to teaching and practicing mindfulness (Dimidijian & Linehan, 2003). Group-based mindfulness interventions are widely reported to provide a supportive and normalizing environment (Cormack et al., 2018). They have also been linked to increased wellbeing (Brown et al., 2003) and decreased risk for depression (Hawkley et al., 2006).

Emerging research suggests that regular mindfulness practice during the pandemic has been helpful. Matiz et al. (2020) found that teachers in Italy reported improvements in anxiety, depression, affective empathy, emotional exhaustion, and well-being following a two-month mindfulness intervention after the onset of COVID-19 lockdown. Meditation techniques are easy to learn, easy to support online (Chadi et al., 2018; Champion et al., 2018; Krusche et al., 2013), and can be done digitally as an individual or group practice. Research has shown that online delivery of mindfulness training can effectively reduce symptoms of depression and anxiety and increase well-being and mood in a timespan as short as two weeks (Cavanagh et al., 2013; Forbes et al., 2018). With social distancing and quarantine restrictions keeping us physically separate and yearning for connection, fostering feelings of connectedness and wellbeing is essential. Based on the evidence of efficacy and ease of virtual delivery, mindfulness represents a promising tool; however, most people do not have free access to an evidencebased digital mindfulness program.

The primary aim of this paper is to outline the development, implementation, and preliminary outcomes of a virtual mindfulness program created at a university to increase connection across campus and decrease the negative impact of the pandemic. The transition to remote work and learning led to faculty, staff, and student reports of feeling isolated from the campus community and beyond. Our synchronous digital mindfulness program, Mindful Moment, sought to provide widespread and easy access to an evidence-based wellness tool (i.e., group mindfulness practice) as a vehicle for connectedness and general wellness support during the pandemic. We examined the adoption and engagement of Mindful Moment as primary outcomes and explored preliminary evidence of well-being, stress, and connectedness among attendees as secondary outcomes.

Method

Mindful Moment Program

We are a center located on a US university medical campus that is committed to supporting innovative, evidence-based technology solutions to address mental health prevention, access, and treatment challenges across a range of mental health conditions. Mindful Moment launched in September 2020. We hosted two live 5-minute guided meditation sessions via a virtual webinar platform twice per week at the beginning of business hours. The sessions aimed to be approachable and effective for attendees with varied mindfulness experience ranging from beginner to advanced practitioner. Individuals were given the opportunity to register for Mindful Moment at any time during the months the program was offered. The meditation exercises were led by two psychologists at our Center with mindfulness training. Those who joined Mindful Moment sessions could only see the leader of the session via Zoom video and could not see other participants or their names. The sessions utilized evidence-based mindfulness content and covered various practice types (e.g., grounding, breathwork, gratitude, self-compassion, lovingkindness, visualization, movement). The theme changed each week, which allowed attendees to gain experience with various techniques. The consistent theme throughout the week was also designed to increase program engagement via the opportunity to build mastery in a single approach over the week.

We promoted the program on our Web site, social media, and as part of campus-wide emails distributed through the university media team. All registrants received periodic emails with program updates and contact information should they have any questions. Participants were able to cancel



their registration at any time. We sent reminder emails to registrants the day before all scheduled sessions, including a link that registrants could use to add the sessions to their online calendar. At the end of each guided meditation session, we posted information about mindfulness, a link to our website for additional information, and a link to an anonymous experience survey designed to elicit feedback for future development. The program, originally scheduled to be ongoing for two months, was extended through the end of 2020 and into the new year based on consistent high engagement. Additionally, Mindful Moment was expanded to include a live midday 15-minute guided meditation session at the start of the week in response to requests for more frequent and longer meditations.

Design

The information reported in this paper focused on whether the Mindful Moment program increased access to a well-being resource and to inform immediate decisions about whether or not the program should be continued. The project was carried out as a quality improvement (QI) project and did not meet the definition of research per Department of Health and Human Services regulations. Documentation indicating the QI status was completed and stored in internal project records according to IRB guidelines. This evaluation was exploratory in nature, thus standardized assessments were only administered at a single time point and there was no control group.

Attendees

Mindful Moment was promoted to university faculty, staff, and students through campus correspondence and social media but was not limited to those with affiliation to campus; it was open to anyone, and demographic data were not collected. Attendees were not given any incentives in order to complete feedback surveys, standardized assessments, or interviews. Volunteers who attended Mindful Moment provided general feedback on the program and whether or not the program should be continued. Attendees who elected to participate in interviews were informed of how their responses may be used and agreed to have their interview recorded.

Methods and Data Collection

The anonymous Experience Survey, available via weblink at the end of each session, was five questions and assessed the perceived helpfulness of the most recent session and likelihood of future attendance. Open-ended questions also elicited feedback on the guided meditation length and any other comments. Attendees were invited to complete

the survey as often as they would like. There was no way to identify how many times a single attendee completed the survey or how many attendees completed at least one survey.

We developed an end-of-year (EOY) survey that was disseminated via email to all individuals who were currently registered for Mindful Moment. It was also included in the webinar chat at the end of Mindful Moment sessions for two weeks in place of the original Experience Survey. The EOY survey was composed of both standardized assessments and open-ended questions, including how many sessions respondents had attended and several questions about the impact of Mindful Moment on well-being and sense of connectedness to others. The EOY survey was also anonymous, but respondents were given the option to provide their contact information if they wanted to complete a semi-structured, virtual individual interview with our Center's staff to further discuss their experience.

Attendees who completed interviews were asked about their general experience with the program, how the program influenced their mindfulness practice, and how, if at all, Mindful Moment had impacted their well-being, stress, and sense of isolation. Interviewees were also invited to share general feedback and recommendations. All interviews were audiotaped and transcribed for analysis with the interviewee's permission.

Standardized Assessments

Stress

The 4-item Perceived Stress Scale (PSS-4; Cohen et al., 1983) was included as part of the EOY survey. It is a brief version of a longer standardized stress assessment that has demonstrated adequate psychometric properties. Items gauge how unpredictable, uncontrollable, and overloaded respondents find their lives (Cohen et al., 1983).

Belonging

The General Belongingness Scale (GBS; Malone et al., 2012) was also included as part of the EOY survey. It is a 12-item measure of general belongingness that has demonstrated high reliability and consistent evidence of validity (Malone et al., 2012).

Both standardized measures were selected based on the combination of evidence of reliability and validity combined with brevity in order to minimize the burden to respondents while completing surveys. Not all outcomes were assessed with standardized tools; these constructs were selected as key outcome variables.



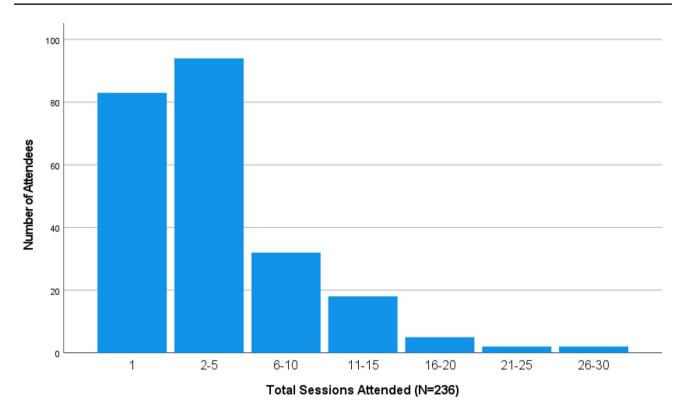


Fig. 1 Total number of sessions attended between september through december

Qualitative Analysis

Our team analyzed interviews using NVivo 12 qualitative software (QSR International). Transcripts were analyzed based on a priori codes (aligned with the study questions) and emergent themes, following the guidance of Miles et al. (2018). A data display matrix helped in identifying consistent themes across the 10 interviews completed. To help rule out threats to validity, our team reviewed text within each code to identify discrepant data (Maxwell, 1996) so that views atypical of the rest of the group were included throughout the findings. Through an inductive analysis, seven themes emerged, all of which are presented below.

Results

Three hundred sixty-six individuals registered for Mindful Moment, and 236 individuals attended anywhere from 1 to 30 sessions. There was a total of 32 mindfulness sessions

from September through December 2020, and out of active attendees, over 53% of individuals attended anywhere from two to 10 sessions (Fig. 1). A small subset of attendees consistently participated, with nine participants joining 16 or more sessions. The number of registrants fluctuated due to employee and student turnover or if an individual selected to cancel their registration. As of the end of December, there were 332 individuals registered for the program of the 23,500 students, faculty, and staff at the university campus.

On average, attendees attended at least two sessions per month across the four months evaluated (Table 1). Although there was a slight decrease in attendance for single sessions across time, the number of program registrants increased slightly. The number of attendees per session ranged from 17 to 59. The average number of attendees per session was 32.13 (SD = 9.78, Fig. 2). The highest attendance occurred during the fourth session in September, when 59 people joined. Another peak in attendance occurred immediately before and after the election, from October 29th to November 5th, when 40 or more individuals attended each session (Fig. 2).

Table 1 Program attendance by month compared to number of registrants

	September	October	November	December
Number of attendees	157	93	95	83
Mean sessions per attendee (SD)	2.05(1.39)	2.38(1.73)	2.48(1.59)	2.51(1.60)
Total number of registrants	278	297	323	332



Of the 194 Experience Surveys collected between September 2020 and January 2021, 72.0% identified as university medical staff, 15.5% as hospital staff, and 12.4% from other colleges in and outside of the university system. All rated the Mindful Moment session they just attended as "helpful" (43.0%) or "extremely helpful" (56.5%). Nearly all mentioned they were either "somewhat likely" (12.0%) or "extremely likely" (86.4%) to attend another Mindful Moment session. Of the 194 responses, 140 also offered responses to at least one of the two open-ended questions. It is likely that attendees responded to the survey on multiple occasions but it is unknown how many individuals responded due to the survey's anonymity.

Of the 49 End-of-Year (EOY) Surveys collected between December 2020 and January 2021, 85.1% were from the university community, namely faculty/staff (76.6%), residents/fellows/graduate students (4.2%), and other (19.1%). More than half (55.3%) reported having an established mindfulness practice, either at least once daily (24.0%), 2 to 6 times a week (32.0%), 1 to 2 times a week (36.0%), or 2 to 3 times a month (8.0%). Of the 32 sessions offered during this time frame, the mean attendance was 9.98 sessions.

Standardized Assessment Data

Stress

The Perceived Stress Scale (PSS-4; Cohen et al., 1983) was completed by the 49 attendees who completed the anonymous End-of-Year Survey. Total scores for the PSS-4 range from 0 to 16, with higher scores indicating more stress. The mean PSS-4 score was M=5.76 (SD=2.78). Further, 54.3% of respondents were confident in their ability to cope with personal problems "fairly often" and 19.6% indicated "very often."

Belongingness

Items on the General Belongingness Scale (GBS; Malone et al., 2012) are rated on a seven-point Likert scale, and the maximum score is 84, with higher scores indicating a greater sense of belongingness. The mean GBS score was M=61.90 (SD=12.87). Twenty-eight percent of respondents reported some degree of feelings of isolation. With regard to connection, 39.5% of individuals indicated that they "somewhat agree" with the statement, "I feel connected with others" and less than 12% of respondents disagreed to any degree.

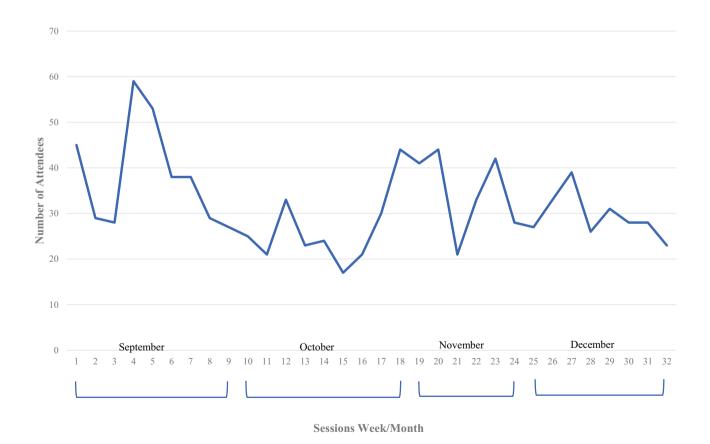


Fig. 2 Total number of attendees by individual session

Themes from Qualitative Data Analysis

Results from the thematic qualitative analyses provided evidence of seven themes, related either to adoption and engagement or to outcomes and impact of Mindful Moment. Each is outlined below.

Adoption and Engagement Themes

Recognition of the Need

Through interviews and surveys, attendees described how the mindfulness program helped address their need to reduce stress and feelings of isolation during the pandemic. With routines continually changing, the Mindful Moment program was a draw for individuals seeking a sense of normalcy in their day to day lives. One attendee stated:

Oh it's definitely the coping skills I need right now. I can close my eyes or I can take a deep breath, and I can just know that there are other people out there. It's been very helpful, and it is a unique and challenging time.

Many expressed gratitude to the university for offering this mindfulness-based tool to address their struggles. Several attendees emphasized that they were pleased to see the university being proactive in addressing burnout and facilitating a program to improve well-being. Further, because the university sponsored it, several interviewees mentioned feeling justified in protecting the time to participate. One respondent said it was "helpful to know that the [university] community recognizes how hard this is and how much we all struggle" and "comforting to know that there are people out there that understand and want to have a minute to bring people together."

A few attendees mentioned ways to increase outreach, particularly to university alumni and to specific departments on campus, unsure how widely Mindful Moment was known. Although this program was created to address mental health issues brought on by COVID-19, attendees expressed the desire to continue with the program even after the pandemic.

Ease of Engagement

A pervasive theme throughout surveys and interviews was the ease of engagement. Mindful Moment was predictable and straightforward. It was brief, online, and could be easily scheduled into the workday. Many survey respondents mentioned the early time was convenient, allowing them to avoid work and school conflicts. Reminders were on attendee calendars, inviting them to join that day if they wished, without obligation. Having this as a scheduled event was key. One

respondent said, "I don't have to go anywhere to participate. I can click on a couple of buttons and have the screen and look and be in my own little world and participate without having to talk."

Although most spoke of the benefits of easy engagement and online anonymity, a few mentioned they would have wanted more accountability as an encouragement to attend more often. Thinking that no one knew if they were in attendance, attendees felt that they would not be missed. Other ideas mentioned to increase engagement were more frequent and longer sessions.

Observation of Immediate Benefits

In response to questions about what made them continue to attend from week to week, interviewees consistently stated that they experienced Mindful Moment as a "safe space." Several interviewees relayed that it was the boost they needed at the beginning of the day to "take a quiet break," and "pause," to set their mind in the right direction. Several mentioned when they missed mindfulness on that day, they, and others close to them, noticed. One person described their experience as, "A way to start your day in a calm way with some guided imagery to both relax and set your mind into a place where you are welcoming what's coming."

For anyone new to mindfulness, having a facilitator as a guide was a gentle entrée into a new practice, guided and without pressure. It was never perceived as too advanced. Having a facilitator with a relaxed, calming presence brought attendees back again and again. One person said: "I am terrible at meditating. I like that it is frequent and short, so I feel like I am working my way toward proficiency." Experienced meditators mentioned it was easily added as a supplement to their existing practice, though often considered too brief. A few mentioned that improving the audio's clarity, slowing the pace with more silence, and adding greater diversity in leaders could further enhance the experience.

Outcomes and Impact Themes

Increased Focus on the Present

Mindful Moment increased attendee awareness of the present, both during the session and throughout the day. For several, it was a rare moment to call attention to their own needs. One survey respondent noted the practice "teaches focus," and another stated, "it forces me to press pause and just focus on me."

Several attendees mentioned breathing techniques allowed them to focus more fully on the present. A few new to meditation noted during interviews they were now "more intentional about breathing." A few requested that leaders



spend even more time during the meditation on breathing techniques. One person said: "It makes me realize how, just by breathing differently, I can change the kind of infrastructure of what I am bringing into the space."

Several survey respondents and interviewees mentioned that the brief morning session improved their sense of productivity throughout the day. One said it helps them "remember to let things go that I am struggling with in my life currently so I can be ready to give 100%."

Well-Being

Through surveys and interviews, many attendees described positive changes in their overall sense of well-being. One attendee said, "This year has been about everything unexpected, over and over and over and over, so having something that I can expect that's pleasant is really lovely." Attendees noted how the program helped them to feel more "grounded," "centered," and have a sense of being "anchored." Others noted feeling "calm," at "peace," and more "relaxed" after their Mindful Moment experience. A few shared how it put them better in touch with their own emotions. One said: "To have the stability and structure to look forward to is so, so, so powerful... I share this to show how intense it really is."

Stress and Stress Reduction

Many attendees described relying on Mindful Moment to reduce stress and strengthen coping skills. Many noted that they could carry the tools into their daily lives. Attendees also noted the ability to recognize the positive emotions cultivated from the meditations while directing focus away from the anxiety they experienced in response to the pandemic:

Well, I think it helps alleviate or calm stress that you have... I try to remind myself all the time that it doesn't do you any good to stress over something that you can't control. Although that's very hard sometimes, I think it helps with that.

Sense of Belonging, Connection, and Common Purpose

By creating a program that brought together the university community, despite being physically apart, many attendees noted it offered a sense of connection and comfort they were lacking throughout the pandemic. One university faculty member mentioned that it had deepened her sense of pride in working for the university. Some felt that all attendees participating in the program shared a common purpose in seeking mindfulness as a tool to deal with life's stressors. One attendee stated:

I think as we have all felt so isolated in this period of being remote, just knowing that there are other people doing this at the same time around something pleasant, unlike the election and all of the other things that we are all doing at the same time that are maybe not as easy. This has been just a pleasant way to feel connected to others.

A few attendees stated that this connection was absent or irrelevant to their mindfulness practice. Some respondents described the program as "anonymous," referring to other attendees as "unknown people." The anonymity of the webinar delivery was a barrier to feeling connected for a few. Several respondents noted that seeing others on the screen would have enhanced their sense of connection with the community. Some of the attendees who expressed a lack of connection mentioned wanting more interaction with the other "like-minded" people who joined the sessions. One said: "Just to have a chance to kind of reflect [would help increase connection]...I think it could be reflecting on the meditation or even saying something, you know, positive you experienced during the week or something that uplifted you."

Discussion

Experts in the public health field have highlighted the crucial need to prepare for the severity of mental health issues brought on because of the pandemic (Galea et al., 2020). Overall, Mindful Moment was successfully implemented in the context of the pandemic, and attendees provided overwhelmingly positive feedback. Due to our high engagement rates, the relative ease of continued implementation, and requests for continuation, we will continue to provide this resource as an innovative digital wellness resource to our community and beyond, into the foreseeable future.

Findings from our surveys and interviews suggest that many attendees participated in the program due to a need for coping resources in response to COVID-19. Attendance data also suggest that Mindful Moment was a feasible and acceptable program as evidenced by the high rates of people who attended at least one session, attended multiple sessions, and by the mean attendance of 30–40 people per session. Qualitative data suggest that both feasibility and acceptability were facilitated by several factors related to making attendance easily accessible (e.g., scheduled outside of common work and class hours, sessions added to registrants' calendars by the click of a button, reminder emails sent the day before sessions) and by attendees' experience of immediate gains following the practice. Respondents also felt that it was easier and more acceptable to reserve time for this practice because their workplace sponsored the program. Attendees

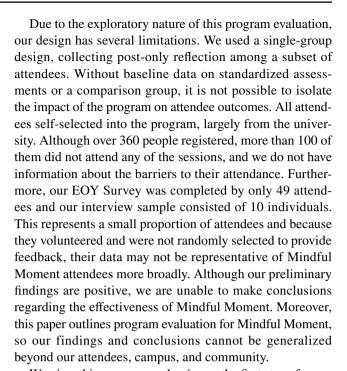


noted finding specific themes to be particularly helpful and frequently shared that participation made them feel more grounded, productive and present, less stressed, and more connected to a valued community.

Data from surveys and interviews provided detailed and nuanced feedback about session length and sense of connection to other attendees. Some attendees enjoyed the short sessions, mentioning that the session length made them more palatable for beginners and easier to schedule into their day. Other more experienced meditators noted that the five-minute sessions felt too short to truly get connected to the mindfulness experience. With regard to connection, many expressed a desire to debrief and connect with other attendees following the Mindful Moment session. In contrast, others simply stated that seeing and speaking with other "likeminded" people would add to their sense of belonging within our community.

The findings of the present evaluation are consistent with previous evidence of the well-being and stress reduction benefits associated with mindfulness practice. Despite evidence of its effectiveness, finding a mindfulness delivery medium that is also sustainable over time has been challenging. Online delivery of mindfulness has increased accessibility, affordability, and feasibility of engaging a greater mindfulness practice population. However, several studies have shown that despite these benefits, online mindfulness interventions have significantly higher attrition rates than in-person mindfulness programs, with rates of 70% and 29%, respectively (Gutierrez et al., 2020). Similarly, a review of mindfulness-based iPhone apps found that very few apps have high engagement levels on the Mobile App Rating Scale (Mani et al., 2015). Another study on two popular mindfulness meditation apps, Headspace and Smiling Mind, found very low adherence to the app during a 30-day period, with half of attendees reporting never using the app (Flett et al., 2019).

The information and feedback described above suggest that our findings of Mindful Moment's consistent high attendance are unique. We believe our implementation of this program could serve as a model for other universities or large organizations hoping to deploy similar programs. This model of virtual implementation may be especially valuable within the context of a pandemic given that empirical evidence supports benefits associated with wellness resources provided in an organizational context, including lower absenteeism, higher job satisfaction, and greater personal health (Dailey & Zhu, 2017; Parks & Steelman, 2008). Given the mixed feedback from our findings regarding session length and anonymity, groups looking to implement an online mindfulness program may want to explore the length of the sessions and options for directly facilitating connection among attendees as additional methods to maintain high engagement.



We view this program evaluation as the first step of many in understanding the implementation and impact of a live, online guided mindfulness program to support wellness for a university community. More formalized research that addresses the limitations of the present program evaluation is needed. Although penetration was small in relation to our campus population, we have the goal of increasing it through program expansion (Hermes et al., 2019). The present findings are compelling and make a case for the importance of future research to explore the efficacy of Mindful Moment as a resource to facilitate well-being and connection among community members. Future study designs should take a research approach, incorporate longitudinal data collection from a higher proportion of the attendees, and use a comparison group. Attendee demographic data should also be collected so that themes and conclusions can be drawn regarding diverse population experiences with this mindfulness practice. We have many goals for future development of Mindful Moment. In addition to having offered a longer practice, we want to increase the frequency of the brief guided mindfulness sessions to more than two times per week. We also plan to recruit additional mindfulness leaders to increase exposure to variety of content and overall experience.

Additionally, we will consider offering sessions that are not anonymous for regular attendees and providing a method for attendee communication or debriefing following each session. Finally, examination of the attendee and respondent data has also contributed to planning for ongoing deployment. We hope to increase engagement and expand the program to others through promoting the program throughout our community partners and the greater university



community. We will continue evaluation endeavors related to the program. Due to its innovative and easily accessible nature, digital mindfulness programs may have the potential to become a staple of university and community wellness resources even beyond the pandemic.

Authors' Contribution Conceptualization & Methodology: Chloe Nicksic Sigmon, Debra Boeldt, Formal analysis and investigation: Erika Moldow, Dina Bam, Sarah Beary, Writing: All authors, Writing – review and editing: All authors

Funding The work of this group is grant-funded from Anschutz Foundation. Award #: N/A.

Data Availability Yes, can be made available upon request.

Materials Availability Yes, survey responses can be made available upon request.

Declarations

Ethics Approval The project was carried out as Program Evaluation and did not meet the definition of research per DHHS regulations. The project may not be described as research. Ethics approval was waived by COMIRB due to scope of project being program evaluation.

Consent to Participate Not applicable; attendees voluntarily participated in a public program and the scope of the project does not meet the definition of research.

Consent for Publication Not applicable; attendees voluntarily participated in a public program and the scope of the project does not meet the definition of research. No identifiable data is included in this manuscript.

Conflicts of Interest/Competing Interests The authors have no relevant financial or non-financial interests to disclose. The authors have no conflicts of interest to declare that are relevant to the content of this article.

References

- Allen, T. D., & Kiburz, K. M. (2012). Trait mindfulness and work– family balance among working parents: The mediating effects of vitality and sleep quality. *Journal of Vocational Behavior*, 80, 372–379. https://doi.org/10.1016/j.jvb.2011.09.002
- Bowden, D., Gaudry, C., An, S. C., & Gruzelier, J. (2012) A comparative randomised controlled trial of the effects of brain wave vibration training, iyengar yoga, and mindfulness on mood, well-being, and salivary cortisol. Evidence-Based Complementary and Alternative Medicine, 2012. https://doi.org/10.1155/2012/234713
- Brown, K. W., Kasser, T., Ryan, R. M., Linley, P. A., & Orzech, K. (2009). When what one has is enough: Mindfulness, financial desire discrepancy, and subjective well-being. *Journal of Research in Personality*, 43, 727–736. https://doi.org/10.1016/j.jrp.2009.07.002
- Brown, S. L., Nesse, R. M., Vinokur, A. D., & Smith, D. M. (2003). Providing social support may be more beneficial than receiving

- it: Results from a prospective study of mortality. *Psychological Science*, 14, 320–327.
- Carmody, J., & Baer, R. A. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine*, 31, 23–33. https://doi.org/10.1007/s10865-007-9130-7
- Cavanagh, K., Strauss, C., Cicconi, F., Griffiths, N., Wyper, A., & Jones, F. (2013). A randomised controlled trial of a brief online mindfulness-based intervention. *Behaviour Research and Therapy*, 51, 573–578. https://doi.org/10.1016/j.brat.2013.06.003
- Chadi, N., Weisbaum, E., Malboeuf-Hurtubise, C., Ahola Kohut, S., Viner, C., Kaufman, M., & Vo, D. X. (2018). Can the Mindful Awareness and Resilience Skills for Adolescents (MARS-A) program be provided online? Voices from the Youth. *Children*, 5, 115. https://doi.org/10.3390/children5090115
- Champion, L., Economides, M., & Chandler, C. (2018). The efficacy of a brief app-based mindfulness intervention on psychosocial outcomes in healthy adults: A pilot randomised controlled trial. *PLoS One*, 13, e0209482. https://doi.org/10.1371/journal.pone. 0209482
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of health and social behavior*, 385–396.
- Cormack, D., Jones, F. W., & Maltby, M. (2018). A "collective effort to make yourself feel better": The group process in mindfulness-based interventions. *Qualitative Health Research*, 28, 3–15. https://doi.org/10.1177/1049732317733448
- Dailey, S. L., & Zhu, Y. (2017). Communicating health at work: Organizational wellness programs as identity bridges. *Health Communication*, 32(3), 261–268.
- Davis, D. M., & Hayes, J. A. (2011). What are the benefits of mindfulness? A practice review of psychotherapy-related research. *Psychotherapy*, 48, 198–208. https://doi.org/10.1037/a0022062
- Dimidjian, S., & Linehan, M. M. (2003). Defining an agenda for future research on the clinical application of mindfulness practice. *Clinical Psychology: Science and Practice, 10*, 166–171. https://doi.org/10.1093/clipsy/bpg019
- Duan, L., & Zhu, G. (2020). Psychological interventions for people affected by the COVID-19 epidemic. *The Lancet Psychiatry*, 7, 300–302. https://doi.org/10.1016/S2215-0366(20)30073-0
- Duchemin, A. M., Steinberg, B. A., Marks, D. R., Vanover, K., & Klatt, M. (2015). A small randomized pilot study of a work-place mindfulness-based intervention for surgical intensive care unit personnel: Effects on salivary α-Amylase levels. *Journal of Occupational and Environmental Medicine*, 57, 393–399. https://doi.org/10.1097/jom.0000000000000371
- Eberth, J., & Sedlmeier, P. (2012). The effects of mindfulness meditation: A meta-analysis. *Mindfulness*, 3, 174–189. https://doi.org/10.1007/s12671-012-0101-x
- Flett, J. A., Hayne, H., Riordan, B. C., Thompson, L. M., & Conner, T. S. (2019). Mobile mindfulness meditation: A randomised controlled trial of the effect of two popular apps on mental health. *Mindfulness*, 10, 863–876. https://doi.org/10.1007/s12671-018-1050-9
- Forbes, L., Gutierrez, D., & Johnson, S. K. (2018). Investigating adherence to an online introductory mindfulness program. *Mindfulness*, 9, 271–282. https://doi.org/10.1007/s12671-017-0772-4
- Galea, S., Merchant, R. M., & Lurie, N. (2020). The mental health consequences of COVID-19 and physical distancing: The need for prevention and early intervention. *JAMA Internal Medicine*, 180, 817–818. https://doi.org/10.1001/jamainternmed.2020.1562
- Gould, E., & Shierholz, H. (2020, March 19). Not everybody can work from home: Black and Hispanic workers are much less likely to be able to telework. *Economic Policy Institute*.



- https://www.epi.org/blog/black-and-hispanic-workers-are-much-less-likely-to-be-able-to-work-from-home/
- Gutierrez, D., Forbes, L., & Johnson, S. K. (2020). Physical and psychological health predict adherence to an online mindfulness program for college students. *Counseling and Values*, 65, 206–221. https://doi.org/10.1002/cvj.12138
- Hanley, A., Warner, A., & Garland, E. L. (2015). Associations between mindfulness, psychological well-being, and subjective well-being with respect to contemplative practice. *Journal of Happiness Studies*, 16, 1423–1436. https://doi.org/10.1007/s10902-014-9569-5
- Hawkley, L. C., Masi, C. M., Berry, J. D., & Cacioppo, J. T. (2006). Loneliness is a unique predictor of age-related differences in systolic blood pressure. *Psychology and Aging*, 21, 152–164. https://doi.org/ 10.1037/0882-7974.21.1.152
- Hermes, E. D., Lyon, A. R., Schueller, S. M., & Glass, J. E. (2019). Measuring the implementation of behavioral intervention technologies: Recharacterization of established outcomes. *Journal of Medical Internet Research*, 21(1), e11752.
- Hülsheger, U. R., Alberts, H. J. E. M., Feinholdt, A., & Lang, J. W. B. (2013). Benefits of mindfulness at work: The role of mindfulness in emotion regulation, emotional exhaustion, and job satisfaction. *Journal of Applied Psychology*, 98, 310–325. https://doi.org/10. 1037/a0031313
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. Clinical Psychology: Science and Practice, 10, 144–156. https://doi.org/10.1093/clipsy/bpg016
- Keng, S., Smoski, J. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*, 31, 1041–1056. https://doi.org/10.1016/j.cpr. 2011.04.006
- Kong, F., Wang, X., & Zhao, J. (2014). Dispositional mindfulness and life satisfaction: The role of core self-evaluations. *Personality and Individual Differences*, 56, 165–169. https://doi.org/10.1016/j.paid. 2013.09.002
- Krusche, A., Cyhlarova, E., & Williams, J. M. G. (2013). Mindfulness online: An evaluation of the feasibility of a web-based mindfulness course for stress, anxiety and depression. *British Medical Journal Open*, 3, e003498. https://doi.org/10.1136/bmjopen-2013-003498
- Lomas, T., Medina, J. C., Ivtzan, I., Rupprecht, S., Hart, R., & Eiroa-Orosa, F. J. (2017). The impact of mindfulness on well-being and performance in the workplace: An inclusive systematic review of the empirical literature. *European Journal of Work and Organizational Psychology*, 26, 492–513. https://doi.org/10.1080/1359432X.2017. 1308924
- Malone, G. P., Pillow, D. R., & Osman, A. (2012). The general belongingness scale (GBS): Assessing achieved belongingness. *Personality* and *Individual Differences*, 52, 311–316. https://doi.org/10.1016/j. paid.2011.10.027
- Mani, M., Kavanagh, D. J., Hides, L., & Stoyanov, S. R. (2015). Review and evaluation of mindfulness-based iPhone apps. *JMIR mHealth and uHealth*, *3*, e82. https://doi.org/10.2196/mhealth.4328

- Matiz, A., Fabbro, F., Paschetto, A., Cantone, D., Paolone, A. R., & Crescentini, C. (2020). Positive impact of mindfulness meditation on mental health of female teachers during the COVID-19 outbreak in Italy. *International Journal of Environmental Research and Public Health*, 17, 6450. https://doi.org/10.3390/ijerph17186450
- Maxwell, J. A. (1996). *Qualitative Research Design*. An Interactive Approach. Sage Publications.
- Michel, A., Bosch, C., & Rexroth, M. (2014). Mindfulness as a cognitive–emotional segmentation strategy: An intervention promoting work–life balance. *Journal of Occupational and Organizational Psychology*, 87, 733–754. https://doi.org/10.1111/joop.12072
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2018). Qualitative data analysis: A methods sourcebook. Sage publications.
- Mitmansgruber, H., Beck, T. N., & Schüßler, G. (2008). "Mindful helpers": Experiential avoidance, meta-emotions, and emotion regulation in paramedics. *Journal of Research in Personality*, 42, 1358–1363. https://doi.org/10.1016/j.jrp.2008.03.012
- Parks, K. M., & Steelman, L. A. (2008). Organizational wellness programs: A meta-analysis. *Journal of Occupational Health Psychology*, 13(1), 58.
- Riva, G., & Wiederhold, B. K. (2020). How cyberpsychology and virtual reality can help us to overcome the psychological burden of coronavirus. *Cyberpsychology, Behavior, and Social Networking*, 23, 277–279. https://doi.org/10.1089/cyber.2020.29183.gri
- Roche, M., Haar, J. M., & Luthans, F. (2014). The role of mindfulness and psychological capital on the well-being of leaders. *Journal of Occupational Health Psychology*, 19, 476–489. https://doi.org/10. 1037/a0037183
- Satici, B., Saricali, M., Satici, S. A., & Griffiths, M. D. (2020) Intolerance of uncertainty and mental wellbeing: Serial mediation by rumination and fear of COVID-19 International. *Journal of Mental Health* and Addiction, 1–12. https://doi.org/10.1007/s11469-020-00305-0
- Schultz, P. P., Ryan, R. M., Niemiec, C. P., Legate, N., & Williams, G. C. (2014). Mindfulness, work climate, and psychological need satisfaction in employee well-being. *Mindfulness*, 6, 971–985. https://doi.org/10.1007/s12671-014-0338-7
- Smith, B. J., & Lim, M. H. (2020). How the COVID-19 pandemic is focusing attention on loneliness and social isolation. *Public Health Research & Practice*, 30, e3022008. https://doi.org/10.17061/phrp3022008
- Tovmasyan, G., & Minasyan, D. (2020). The impact of motivation on work efficiency for both employers and employees also during COVID-19 pandemic: Case study from Armenia. *Business Ethics* and *Leadership*, 4, 25–35. https://doi.org/10.21272/bel.4(3).25-35. 2020

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

