
Mind-Body Interventions for Healthy Aging

Submitted by:

Ruchika Prakash

Associate Professor

Department of Psychology

614-292-8462

prakash.30@osu.edu

Project Information: Abstract

Advancing age is characterized by declines in cognition, brain health, and physical well-being, which bear important consequences for activities that support independent living, such as driving, walking without falling, and decision-making. The proposed project will examine the benefits of mindfulness meditation a scientifically-based training program emphasizing attentional awareness and emotion regulation in enhancing cognitive, affective, and neural functioning in 200 older adults. Funds are requested to cover salary support for study coordinator, programmer, and help defray MRI costs.

Project Information: Narrative

The human lifespan is becoming increasingly protracted with the advent of new health technologies, contributing to an ever-growing population of older adults. The World Health Organization estimates that between 2015 and 2050, the proportion of the world's population over 60 years of age will nearly double, underscoring a need for programs that enhance quality of life in the elderly (WHO, 2015). Although there is a growing industry dedicated to brain training games, their advertised benefits have little empirical support (Kable et al., 2017; Owen et al., 2010). We propose that mindfulness training, which has been shown to improve cognitive decline (Jha et al., 2010; Moynihan et al., 2013), enhance emotion regulation (Chiesa et al., 2011), and alter large-scale brain networks (Allen et al., 2012; Farb et al., 2010), may promote successful aging.

Over the last several years, through rigorously controlled experiments, the Clinical Neuroscience Laboratory, directed by Dr. Ruchika Prakash has sought to establish a link between mindfulness and markers of healthy aging. We have found that trait mindfulness in older adults is negatively associated with the propensity to mind-wander, levels of perceived stress, and emotion dysregulation (Fountain-Zaragoza, Londeree, Whitmoyer, & Prakash 2016; Prakash et al., 2015; Prakash et al., 2017). In the same population, we found evidence supporting a positive association between mindfulness disposition and functional connectivity within brain regions of the default mode network (Prakash, De Leon, Klatt, Malarkey, & Patterson, 2012). More recently, we completed a randomized controlled trial (RCT) in older adults to assess the effects of mindfulness training on attentional control and rates of mind-wandering. We found that training improved attentional outcomes in a subset of our sample and that participants who engaged in greater amounts of practice with the mindfulness exercises tended to benefit more (Whitmoyer et al., under review).

In July of 2017, Dr. Prakash was awarded a Research Project Grant (R01) through the National Institutes of Health to conduct a large-scale randomized controlled trial of mindfulness training. This project will build on the previous pilot RCTs in the following ways: 1) biomarkers of successful aging, including inflammatory markers and patterns of brain connectivity, will be identified, using healthy young adults as a comparison group; 2) these biomarkers will be used as clinical endpoints of the mindfulness intervention; 3) a test/retest group, who will not undergo training, will be included to control for practice effects; 4) a mobile application will be created based on our findings, to distribute this intervention on a worldwide scale.

200 older adults (ages 65-85 years) will be randomized to eight weeks of training in mindfulness meditation (Mindfulness-Based Stress Reduction; MBSR) a lifestyle education group, designed to control for placebo effects, or a test/retest group. Behavioral and neural indices of attentional control and emotion regulation will be collected before and after the 8-week period to establish the efficacy of mindfulness training in supporting healthy aging, relative to an active control condition, and a test/retest condition. Biomarkers of sustained attention (behavioral and neural), emotion dysregulation, and immune functioning will be employed as surrogate endpoints in the clinical trial. Our previous work has already established the reliability and validity of these biomarkers for successful aging, thus an improvement in these metrics, following mindfulness training will provide unequivocal support for the adoption of mindfulness training in reducing age-related cognitive decline.

An additional goal of this project is the development of a mobile application that will leverage the knowledge gained in our RCT to broadly disseminate the mindfulness intervention. Specifically, the availability and ease of mobile applications have allowed for complicated technology and programs to be delivered with relative ease. However, a major limitation of the majority of health-based applications is the lack of empirical evidence supporting the use of such applications. Our mobile app MindfulAgers - will capitalize on the research that will be collected as part of this initiative, to provide users with access to an intervention that has been proven to reduce cognitive decline. This phase of the project will involve designing a mobile application that will be accessible to both Apple and Android users. Our team, comprising of psychologists and programmers, has considerable experience designing and launching mobile applications. MindfulAgers will include didactics on the practice of mindfulness; course materials for 8 weeks of MBSR; key practices on mindfulness meditation; as well as a forum for participants to engage with experts on mindfulness training.

Given the aging of the baby boomer generation, the importance of intact cognition for daily functioning, and that an understanding of the plasticity of the aging brain might offer prevention or delay the onset of dementia, it becomes more important now than ever to design low-cost behavioral interventions for older adults (OA) without pathological cognitive impairment. According to the Alzheimers Association, annual costs of direct care for Alzheimers disease in the United States exceed \$200 billion, not including \$10.2 billion of additional health care costs for caregivers of people with dementias, who exhibit high rates of depression and emotional stress (Alzheimers Association, 2016). The proposed project will provide comprehensive and programmatic support for mindfulness training a low-cost, easy-to-use intervention - in enhancing cognitive functioning, brain health, and overall well-being in older adults.

Project Information: Impact

According to the 2010 Census, 8.6% of residents in the Columbus city area are aged 65 and older, indicating that this cohort comprises a significant portion of our local community. The Healthy Mind, Healthy Aging project represents our laboratory's continued research efforts to characterize markers of healthy aging in this group and to develop an intervention that will support their improved quality of life. Over the last five years, our laboratory housed in the Department of Psychology at OSU has been at the forefront of examining health benefits of mindfulness meditation for older adults. By conducting rigorous, scientific studies on this topic, we are actively contributing to the emerging science in this field. Additionally, we are dedicated to making this laboratory-based scientific research approachable and accessible to the broader public. We have been actively involved in outreach efforts, both locally and nationally, in disseminating this work to the broader public. Dr. Prakash has presented this research at premier academic institutions, like Yale University, the University of Illinois at Urbana-Champaign, Pace University; at national and international conferences, such as the Global Brain Health Summit at Ohio State University, at the International Symposium for Contemplative Sciences, and at the Midwestern Psychological Association; and finally, at public forums, such as the Science Sunday Series organized by the College of Arts & Sciences, Scarlet & Gray MS Education Series organized by the Wexner Medical Center, and at senior centers in and around Columbus. Additionally, our goal of designing an evidence-based application MindfulAgers that would be freely available to a worldwide audience stems from our fundamental belief in translating and disseminating scientific knowledge that benefits the targeted populations. We believe our research program and the complementary outreach efforts are well aligned with the mission and vision of Women & Philanthropy and we look forward to an opportunity to work with your organization.

Links & Additional Resources

http://freud.psy.ohio-state.edu/lab/CNL/The_Lab.html

Project Budget

FUNDING INFORMATION

Does your group currently have an established Ohio State fund where granted funds could be deposited?



Yes



No



Not sure*

Fund ID Number	Fund Name
313298	Women in Psychology

Please list any additional sources of funding anticipated for this project. (*Funding opportunities through Women & Philanthropy will not be jeopardized by additional sources of financial support.*)

Funder Name	Amount	Status
National Institutes of Health	\$1,816,070	Active

Please indicate the total amount of requested funding for expenditures associated with your proposal.

Proposal Expense Items:	Funding Requested from Women & Philanthropy
1. Salaries and Wages	\$35,000
2. Production Materials	
3. Equipment	\$30,000
4. Software	
5. Fabrication	
6. Project Evaluation	
7. Promotion/Publicity	\$5,000
8. Other Expenses:	
- Programmer (Consultant)	\$10, 000
-	
-	
Total:	\$80,000

Dr. Prakash has received a \$1,816,070 five-year research grant (R01) from the National Institutes of Health to conduct this largescale RCT. Given the importance of conducting rigorous and methodologically sound RCTs, we have decided to add a test retest group to the study and will be thus collecting data on 30 additional older adults. We are requesting \$30,000 in MRI costs to collect neuroimaging data before and after the intervention on these additional 30 older adults. Additionally, given the scope of the project, we are requesting funds to support a fulltime study coordinator who will be responsible for all aspects of the study, including recruitment efforts, data collection, organization, and safety monitoring. In addition, funds are requested to support a computer programmer who will help design our evidence based mobile application – Mindful Agers –to allow for broader dissemination of our research program. Finally, funds are requested for promotion and publicity of this study, including funds used for advertising for the study and disseminating the research at national and international conferences.