



# HHS Public Access

Author manuscript

*Adv Mind Body Med.* Author manuscript; available in PMC 2015 May 19.

Published in final edited form as:

*Adv Mind Body Med.* 2015 ; 29(1): 26–33.

## A Healthy Aging Program for Older Adults: Effects on Self-Efficacy and Morale

**Matthew Scult, BS,**

Graduate Student, Center for Cognitive Neuroscience, Duke University, Durham, NC, USA

**Vivian Haime, BS,**

Clinical Research Coordinator, Benson-Henry Institute for Mind Body Medicine

**Jolene Jacquart, BS,**

Clinical Research Coordinator, Benson-Henry Institute for Mind Body Medicine

**Jonathan Takahashi, MD, MPH,**

Resident Physician, Department of Family Medicine, University of Wisconsin-Madison, Madison, WI, USA

**Barbara Moscowitz, MSW, LICSW,**

Program Director of Senior HealthWise, Geriatric Medicine Unit, Massachusetts General Hospital, Boston, MA, USA

**Ann Webster, PhD,**

Director of Mind Body Program for Successful Aging, Benson-Henry Institute for Mind Body Medicine, Massachusetts General Hospital, and Associate in Psychiatry, Department of Psychiatry, Massachusetts General Hospital and, Instructor in Medicine, Harvard Medical School, Boston, MA, USA

**John W. Denninger, MD, PhD, and**

Director of Research, Benson-Henry Institute for Mind Body Medicine, Massachusetts General Hospital and Instructor in Psychiatry, Department of Psychiatry, Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA

**Darshan H. Mehta, MD, MPH**

Medical Director, Benson-Henry Institute for Mind Body Medicine, Massachusetts General Hospital and Instructor in Medicine, Department of Medicine, Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA

### Abstract

---

Correspondence: Darshan Mehta, MD, Benson-Henry Institute at Massachusetts General Hospital, 151 Merrimac Street, 4<sup>th</sup> Floor, Boston, MA 02114 Tel: 617-643-6046, Fax: 617-643-6077, [dmehta@partners.org](mailto:dmehta@partners.org).

**Financial Disclosure:** This work was supported by the Harvard Catalyst at the Harvard Clinical and Translational Science Center, the National Center for Research Resources, and the National Center for Advancing Translational Sciences at the National Institutes of Health (Award #UL1 RR 025758 and financial contributions from Harvard University and its affiliated academic healthcare centers). The content is solely the responsibility of the authors and does not necessarily represent the official views of Harvard Catalyst, Harvard University and its affiliated academic healthcare centers, or the National Institutes of Health.

**Context**—As of 2012, 810 million people were over the age of 60 worldwide, accounting for 11 percent of the population. That number is expected to rise to 2 billion by 2050 or to 22 percent of the overall population. As a result, a growing need exists to understand the factors that promote mental and physical health in older populations.

**Objectives**—The purpose of this study was to develop a healthy aging program for older adults and to measure the changes from baseline to the end of the program in participants' relevant psychosocial outcomes; ie, self-efficacy and morale.

**Design**—The study's Healthy Aging Mind Body Intervention (MBI) was adapted from the Relaxation Response Resiliency Program (3RP) at the Benson-Henry Institute for Mind Body Medicine (BHI), which incorporates elements from the fields of stress management, cognitive-behavioral therapy, and positive psychology. That program was modified with examples and exercises targeted to an older population, and evaluated in the current, single-arm, pilot study.

**Setting**—The program took place at the Massachusetts General Hospital (MGH).

**Participants**—The 9-week Healthy Aging MBI was developed for participants aged 65 and over. Fifty-one older adults from the surrounding community participated in the study's groups.

**Intervention**—A new intervention group began the program every 3 months, with a maximum of 12 individuals per group. For each group, the MBI consisted of weekly, 90-minute sessions for 9 consecutive weeks, directed by a psychologist. The program included sessions that taught participants: (1) a variety of methods to elicit the relaxation response (RR), (2) the practice of adaptive coping and cognitions, (3) behaviors necessary to create a healthy lifestyle, and (4) methods of building social support.

**Outcome Measures**—The research team chose to focus on 2 psychological variables of interest for aging populations: morale and self-efficacy. The study used 2 questionnaires to measure those outcomes, the Philadelphia Geriatric Center Morale Scale (PGCMS), a multidimensional measure of the psychological state of older people, and the Coping Self-Efficacy Scale (CSES), a measure that addresses the multiple dimensions of self-efficacy.

**Results**—Data from 5 intervention groups were combined for the current analysis. Forty-six participants enrolled and completed questionnaires. Of those participants, 41 attended at least 7 out of the 9 sessions. Significant increases in self-efficacy and morale were observed for program completers. After a highly conservative sensitivity analysis, the change for the measure of self-efficacy remained significant, and the change for the measure of morale trended toward significance.

**Conclusions**—The study's healthy aging program appears to be a feasible intervention for older adults, with the potential to increase levels of self-efficacy and morale in participants. Further research is warranted to determine its effects on other psychosocial outcomes and healthcare utilization in aging populations.

## Keywords

Mind-body; successful aging; psychosocial; self-efficacy; morale

As of 2012, 810 million people were over the age of 60 worldwide, accounting for 11 percent of the population. That number is expected to rise to 2 billion by 2050 and to represent 22 percent of the overall population, with older adults surpassing the number of children.<sup>1</sup> As the world population ages, demand will increase for the management of chronic conditions and of needs for long-term care.<sup>2</sup> Given a forecasted shortage of healthcare providers, the increase in demand for these services represents a growing public-health concern.<sup>2</sup> Many chronic conditions, such as diabetes and hypertension, can be managed with the help of behavioral interventions.<sup>3–5</sup> In the context of efforts to meet patients' care needs while slowing growth of healthcare spending, an imminent interest exists in exploring interventions that promote self-care in older populations so that they can better prevent, manage, and cope with mental and physical ailments.<sup>6–7</sup>

## INNOVATION: THE HEALTHY AGING PROGRAM

### Benefits

Healthy aging programs combine insights from programs for chronic-disease management and mind-body interventions (MBIs), with the goal of improving self-care for older adults. Some studies have demonstrated the value of interventions for improving self-care through mind-body techniques in older adults,<sup>8</sup> but most have tended to focus on the use of MBI for participants with a single medical condition, such as chronic back pain or hypertension.<sup>9,10</sup> For example, an intervention in 1577 Medicare patients found that individuals who had myocardial infarctions or who had received cardiac procedures demonstrated significantly lower hospitalization rates after completing a multicomponent MBI. The findings for the intervention group also showed trends for yearly savings in the cost of care and lower overall rates of mortality when compared to those of control participants.<sup>11</sup>

Initial studies with heterogeneous populations have also been encouraging. One such multicomponent intervention found decreases in self-reported sleep difficulties, pain, anxiety, and depressive symptoms compared to a control group as well as changes in the health locus of control beliefs, which describe a patient's beliefs about their ability to control their health.<sup>12</sup> It was found that stronger beliefs of ability to control health outcomes, for example beliefs about ability to control stress levels and coping, were related to greater positive health behaviors. At a one-year follow-up, the study's intervention group maintained its benefits related to sleep and locus of control and also showed an increase in health behaviors; such as engaging in exercise, maintaining good nutrition, having interpersonal support and utilizing stress management techniques.<sup>12</sup>

Another study enrolled patients with chronic diseases in a community-based, self-management program that taught exercise, relaxation techniques, nutrition, sleep management, strategies for emotional regulation, and methods for health-related communication and decision making. The program resulted in improved health behaviors and status as well as fewer hospitalizations and fewer days of hospitalization compared to waitlisted controls.<sup>13</sup> Results were maintained at a 2-year, follow-up evaluation, including evidence that the program reduced healthcare costs.<sup>14</sup>

The studies discussed above have demonstrated that programs for chronic-disease management have the potential to reduce both use of the healthcare system and healthcare costs, while they improve patients' health; however, further research is needed to test the effectiveness of healthy aging interventions more broadly applicable to the promotion of self-care in older adults.

### Conceptual Basis

Healthy aging programs have been inspired by group MBIs that focus on elicitation of the relaxation response (RR). The RR is a physiological state that is characterized by decreased heart rate, blood pressure, rate of breathing, and muscle tension. Regular elicitation of the RR has been shown to be an effective therapeutic strategy for a wide range of stress-related and chronic diseases, including immunological, cardiovascular, and neurodegenerative diseases,<sup>15</sup> and has also been shown to aid in improving attention in older adults.<sup>16</sup> RR-based MBIs also appear to be effective in decreasing symptoms in patients suffering from depression and anxiety.<sup>17,18</sup> Furthermore, elicitation of the RR has been shown to have profound effects on physiology, including altering the genetic expression of gene families involved in oxidative stress, energy metabolism, and inflammation,<sup>19</sup> which can impact processes related to chronic diseases.

In addition to elicitation of the RR, healthy aging programs are based on promoting other aspects of resiliency.<sup>20</sup> One aspect is physical activity. Regular physical activity is particularly important for the physical and mental health of older adults.<sup>21</sup> Previous studies have shown that regular physical activity can produce long-term health benefits, such as improved cognitive function, better sleep quality, lower risk of falls and broken bones, increased positive well-being, and improved quality of life.<sup>22,23</sup> Regular physical activity has also been shown to reduce the risk of some age-related diseases and disabilities; eg, balance problems or difficulties walking, as well as to manage many chronic conditions, such as arthritis, heart disease, and chronic pain.<sup>24,25</sup>

Another component of resiliency that is important for aging populations is having a sense of purpose in life and a strong social network. Several studies among aging populations have suggested high levels of social activity and support are related to greater physical health,<sup>26</sup> life satisfaction, and happiness<sup>27</sup> as well as to better physical and cognitive functioning, greater overall well-being, and reduced mortality.<sup>28,29</sup> One study found that friendship identity, the meaning attributed to oneself in the role as friend (i.e. "As a friend I am..." "social", "confident", "happy", "open", "warm", "successful", "interested"), predicted well-being more than income or marital status.<sup>30</sup> A sense of purpose has also emerged as an important factor for aging populations. Another study found that adults aged 50 and older who were highly engaged in work or volunteer activities, reported greater psychological well-being than those who were not involved.<sup>31</sup>

### A Program for Older Adults

The new Healthy Aging MBI was developed for participants aged 65 and over. It was designed to be accessible to a broad population, and for that reason, was implemented at a low cost and through a community-care setting. It was implemented in collaboration with

MGH Senior HealthWISE, a free hospital-based community benefit program designed to enhance the health and well-being of older adults in the neighborhoods surrounding MGH. The goal of HealthWISE is to improve health management through education and support, as well as provide opportunities for socialization, exercise and connection to community resources for individuals over the age of 60.

The new program was adapted from the Relaxation Response Resiliency Program (3RP) at the Benson-Henry Institute for Mind Body Medicine (BHI),<sup>20</sup> which incorporates elements from the fields of stress management, cognitive-behavioral therapy, and positive psychology. The current research team modified that program by creating examples and exercises targeted to an older population. Overall, the new program was developed to promote skills that could enhance the psychosocial variables that are important for the health of older populations: self-efficacy and morale.

**Self-efficacy**—Self-efficacy, a person's belief in his or her ability to influence life events,<sup>32</sup> has been associated with increased self-care among older persons,<sup>33</sup> as well as with improvements in older persons' ratings of their healthy aging.<sup>6</sup> Self-efficacy has also been found to act as a mediator of changes in health behaviors and in use of the healthcare system.<sup>14,34</sup> For older adults, self-efficacy has also been related to increased energy, better sleep, and decreased pain and discomfort as well as with overall satisfaction with life.<sup>33</sup> Improving self-efficacy in aging populations is an important goal because self-efficacy has been associated with increased resilience against development of depression<sup>35</sup> and with better overall health.<sup>36</sup>

**Morale**—Another important psychosocial factor, morale has also been positively associated with healthy aging. Morale is a multidimensional construct that includes the amount of anxiety experienced, an individual's attitude toward his or her own aging, and the level of acceptance or dissatisfaction with social interactions.<sup>37,38</sup> A better state of morale has been shown to be negatively associated with functional disability and positively associated with strength of social network and level of activity.<sup>39</sup> Furthermore, it has been shown to be an independent predictor of physical-health outcomes, such as decreased incidence of stroke<sup>40</sup> and overall mortality.<sup>41</sup>

In its current, single-arm, pilot study, the research team evaluated the feasibility of the new Healthy Aging MBI and recorded self-reported levels of self-efficacy and morale. The team hypothesized that participants would demonstrate increases in self-efficacy and morale relative to their baseline assessments after completing the groups.

## METHODS

### Participants

To obtain participants, the current study's MBI program was advertised via the Massachusetts General Hospital's (MGH's) newsletter. The group facilitator also gave a public lecture previewing the program at MGH. Subjects were recruited from individuals participating in the MGH Senior HealthWISE program. Patients were screened for their ability to participate in the program (attend session, follow instructions, do home practice).

Also, it was ensured that patients had an established primary care provider, in case of any acute medical issues to be addressed.

An initial intake assessment was conducted by an internal-medicine physician and a psychologist. Participants were required to be 65 or over, have no acute psychiatric or medical condition that would substantially interfere with group participation, and be able to speak and understand English. Approval for the use of human participants was obtained from the Partners Human Research Committee. Participants were informed in the written consent about the nature of the study. Fifty-one older adults participated in the groups.

## Intervention

A new intervention group began the new MBI program every 3 months, with a maximum of 12 individuals per group. Five groups of 8–12 individuals participated in the intervention. For each group, the program consisted of weekly, 90-minute sessions for 9 consecutive weeks, directed by a psychologist. Each session had one or two central themes and multiple sub-themes. The program included sessions that taught participants: (1) a variety of methods to elicit the RR, including breath focus, single-pointed focus, imagery, contemplation, chair yoga, and mindful awareness, which all involve repeatedly bringing the attention gently back to either the breath, an imagined scene, movement or one of the senses; (2) the practice of adaptive cognitive coping and cognitions; eg, optimism and acceptance, (3) behaviors necessary to create a healthy lifestyle; eg, recommendations for nutrition, exercise, and restorative sleep; and (4) methods of building social support. Details of the program are provided in Table 1.

Throughout the course of treatment, participants were asked to elicit the RR at home each day, through development of a consistent mind-body practice. They were instructed to use the provided CD, recorded by the psychologist, to practice a meditation for 20 minutes daily. Self-monitoring diary sheets were provided to participants to help them keep a record of their daily meditation practice. Participants also completed brief homework activities that reinforced the concepts learned during group sessions. The group's facilitator collected the diary sheets and written homework each week and handed them back the following week with written comments.

In addition to focusing on elicitation of the RR and increasing resiliency, the new program also focused on increasing self-efficacy and morale as well as promoting healthy lifestyles. Two practices for achieving healthy lifestyles, (1) mindful eating, which involves slowly eating and being aware of the sensations associated with each bite, (2) and physical activity was promoted through chair-yoga sessions. Chair yoga involves a sequence of stretches that participants perform while seated that brings attention to physical activity in a non-judgmental and accessible manner. Participants were also encouraged to incorporate regular physical activity into their days. In addition, participants engaged in experiential exercises related to mindful eating during group sessions and explored food choices that promote resilience.

Through the group-based approach, participants also explored ways in which to develop the healthy aspects of social support. Participants were asked to keep daily appreciation

journals, in which they wrote about people and events in their lives that they were thankful for. They would also begin sessions by sharing “news and goods,” recent positive events, with the group. Participants were asked to explore and challenge patterns of distorted or irrational automatic thoughts that were prevalent in their lives through the use of diary entries and worksheets. Participants also were encouraged to set goals and to discover meaning and purpose in their lives by taking up new hobbies, by volunteering, or by learning something new. Finally, group exercises promoted humor, empathy, and social support.

Sessions followed a regular structure and included time for didactic, experiential, and discussion portions. During the first portion, the psychologist handed back diary sheets and then used the sheets to encourage group members to share their entries and reflections. The second portion consisted of eliciting the RR with a 15-minute guided meditation led by the psychologist.

### Outcome Measures

The current study focused on 2 psychological variables of interest for aging populations that are related to concepts of resiliency and self-care: morale and self-efficacy.

**The Philadelphia Geriatric Center Morale Scale (PGCMS).**<sup>38</sup>—This scale has 17 items and was designed as a multidimensional measure of the psychological state of older people. The 3 dimensions of morale measured by the PGCMS are agitation, attitude toward own aging, and lonely dissatisfaction, the last of which describes depressive mood in relation to social interactions.<sup>38</sup> Each item is binary, with one response indicating high morale and the other low morale. For each item, the high-morale responses receive a score of 1, and the low-morale responses receive a score of 0. Scores range from 0–17, with scores below 9 suggesting low morale. The mean PGCMS score in the original validation study of 928 men and women aged 70 to 90 years was  $11.35 \pm 3.76$ .<sup>37</sup>

**The Coping Self-Efficacy Scale (CSES).**<sup>42</sup>—This 26-item scale addresses the multiple dimensions of self-efficacy, including problem-focused coping, a focus on changing problematic aspects of stressful events, emotion-focused coping, responses focused on changing emotional responses to stressful events, and social support. It is also intended to measure changes in coping self-efficacy following an intervention. Participants respond to the question, “When things aren’t going well for you, how confident are you that you can...?” by assigning a rating from 0–10 to specific stress-coping activities, with 0 indicating no confidence and 10 the highest confidence. Scores range from 0–260, with higher scores indicating greater self-efficacy. The mean CSES score in a community-based validation study of 182, mostly Caucasian, college-educated British men and women, aged 18 to 66 years, was  $159.6 \pm 41.0$ .<sup>43</sup>

### Statistical Analyses

The data from the 5 intervention groups were combined for the purpose of analysis. Analyses were run using SPSS Statistics 17 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to examine groups at baseline. Changes in morale and self-efficacy were

tested using paired t-tests on pre- and postintervention data. Mean imputation was used to complete instruments with missing data for the CSES, and missing items were coded as a 0 for PGCMS, in alignment with the methods used in previous studies.<sup>38,42</sup> If questionnaires were missing >20% they were marked as not-completed.

After completing a primary analysis, a highly conservative sensitivity analysis was conducted to account for those participants who dropped out, in line with recommendations for clinical trials by the National Research Council.<sup>44</sup> As a sensitivity analysis, the research team conservatively assumed that participants who were missing postintervention data accrued no benefit from the intervention. Participants who dropped out of the study or did not fill out pre- or postintervention instruments were given a pre-post change score equal to the largest observed decrease of all participants, which would indicate a worsening score. A Wilcoxon signed rank test was used for the sensitivity analysis.

Of note, the sensitivity analysis includes the pre-test data from one participant who dropped the group and enrolled at a later date, at which time both pre- and post-test data were collected. Since pre-test data was collected twice from this participant, and this was a feasibility study, the original pre-test data was included in the sensitivity analysis with a post-test score that was conservatively computed using the largest observed decrease (worsening) in the group. This was so as to mirror the analyses of data from participants who dropped the group entirely.

## RESULTS

### Participants

Of the 51 older adults who participated in the groups, 46 elected to fill out questionnaires. Of those 46 participants, 41 (89.1%) attended at least 7 out of 9 (78%) sessions. Participants' ages ranged from 66 to 91 years, with an average age of  $75.5 \pm 6.7$ . As shown in Table 2, the majority of participants were female (76.1%) white (89.1%), and retired (74%). Sixteen of the participants were widowed (34.8%); 10 were divorced or separated (21.7%); 9 were single (19.6%); 7 were married (15.2%); and 4 did not report statuses (8.7%).

### Psychosocial Outcomes

At baseline, participants reported a mean  $\pm$  standard deviation of  $10.73 \pm 4.15$  on the PGCMS and  $163.33 \pm 43.73$  on the CSES. The scores on both the PGCMS and the CSES increased significantly among completers of the intervention; ie, the pre- to postintervention change was: (1) PGCMS,  $1.68 \pm 2.94$ ,  $p = 0.001$ ; (2) CSES,  $33.90 \pm 36.30$ ,  $p < 0.001$  (Table 3).

Five participants who completed the PGCMS pre-test did not complete the post-test. Of those participants who completed both pre- and post-test the largest observed decrease was a worsening of 4 points. Therefore, for the sensitivity analysis, this value of  $-4$  was conservatively used as the change score for these 5 participants. Similarly, 7 participants who completed the PGCMS pre-test did not complete the post-test. Of those participants who completed both pre- and post-test the largest decrease was a worsening of 17 points.



Therefore, for the sensitivity analysis, this value of  $-17$  was conservatively used as the change score for these 7 participants.

After the sensitivity analysis, the CSES pre-post change was still significant ( $p < 0.001$ ), and the PGCMS trended toward statistical significance ( $p = 0.064$ ). Excluding the extra pre-test data from the subject who enrolled at a later date, however, would lead to an overall change in PGCMS from pre- to post-intervention would also remain significant ( $p = 0.036$ ).

## DISCUSSION

As the percentage of older adults increases, demand grows for effective, accessible, preventive-care options as does the need to understand factors that promote mental and physical health in older populations. The present study provides the theory and outline of a new Healthy Aging MBI program that was developed specifically to meet the needs of older adults. The high retention and response rates in the study suggest that the program can be a feasible intervention for use among aging populations.

The study also has shed light on important psychosocial factors related to self-care. Statistically significant improvements in self-efficacy and morale were observed after the program, with self-efficacy maintaining significance after a highly conservative sensitivity analysis. The results represent meaningful improvements, with the overall group showing an mean increase from  $10.73 \pm 4.15$  to  $12.41 \pm 4.15$  (15.7%) and from  $163.33 \pm 43.73$  to  $197.23 \pm 39.80$  (20.8%) in PGCMS and CSES scores, respectively.

Numerous studies have noted the importance of psychological variables in improving both quality of life and objective health outcomes.<sup>45,46</sup> In particular, self-efficacy has been used as a theoretical framework to explain the utility of other interventions,<sup>47</sup> and interventions that have been shown to improve self-efficacy are related to subsequent change in health behaviors.<sup>48</sup> Additionally, an interaction has been shown between self-efficacy and change in physical performance, suggesting a buffering effect for self-efficacy against functional decline when older adults are faced with diminished physical capacity.<sup>49</sup>

While self-efficacy remained significant after the sensitivity analysis, morale did not. That finding may be interpreted in the strictest sense as an indication that participants might not have experienced improvements in morale; however, other possible explanations exist for the results. Given that the PGCMS change in the sensitivity analysis was significant when the participant who had 2 sets of data included in the sensitivity analysis—one as a noncompleter due to scheduling conflicts and one as a completer—was only included once as a completer, perhaps the more likely interpretation is that the results observed are due to a lack of power. Further studies with larger sample sizes could determine if lack of power is the case. Overall, the present results provide evidence that psychological variables can be improved through the new, multicomponent, group intervention adapted for older adults.

### Barriers to Implementation and Future Directions

Limitations of the study included a lack of a control group and the fact that the sample was predominantly female and white. Participants consisted mostly of high-functioning

individuals without any severe medical or psychological conditions that would preclude their participation in the program. As a result, participants at baseline were only slightly below or even scored above established norms on the PGCMS and CSES respectively. Future studies could investigate the efficacy of this intervention for more diverse populations, including individuals with lower baseline levels of functioning. In addition, subsequent investigations could explore whether the intervention generalizes to other settings, such as nursing homes or non-hospital community health centers. As designed, the study was intended to collect preliminary data on a new healthy aging program, and the findings suggest that larger randomized controlled studies are warranted.

A final important consideration is that the present intervention was designed to impact multiple individuals working with a single provider rather than the traditional one-on-one encounter. Given that healthcare costs have expanded at exponential rates, national and international imperatives exist to contain costs and still deliver high-quality healthcare. The current study's type of intervention was designed to use an adequate appropriation of resources, and also allowed patients to be participatory in their health and well-being. For future studies, it will be valuable to examine the financial impact of such interventions.

## CONCLUSION

In the current study, the research team was able to demonstrate a feasible model of a group-based Healthy Aging MBI, with potential for adaptation to diverse aging populations. The goal of the program was to teach self-care strategies that allowed patients to thrive well into their later years. This intervention is innovative in its application to a broad aging population, with a range of chronic health conditions, rather than a population with a specific disease. While the current pilot study was intended to demonstrate feasibility, participation in the Healthy Aging MBI was shown to be associated with increases in self-efficacy and morale, which have been established as important mediators of changes in health behavior. Through larger randomized controlled studies, future researchers should examine the relative contributions of the various components of the intervention. In addition, it will important to understand how such group-based MBIs might be helpful in promoting efficient use of health care within diverse populations.

## Acknowledgments

The research team would like to thank Eric Macklin at Massachusetts General Hospital, who advised on the analysis, with support from Harvard Catalyst; Sue Clough at the Benson-Henry Institute; and the staff of Senior HealthWISE for coordinating the Successful Aging groups.

## References

1. Population ageing and development: ten years after Madrid. Population Facts 2012/4. New York, NY: UN Dept of Economic and Social Affairs, Population Division; 2012. UN Dept of Economic and Social Affairs.
2. Wiener JM, Tilly J. Population ageing in the United States of America: implications for public programmes. *Int J Epidemiol.* 2002; 31(4):776–781. [PubMed: 12177018]
3. Chobanian AV, Bakris GL, Black HR, et al. National Heart, Lung, and Blood Institute; National High Blood Pressure Education Program Coordinating Committee. Seventh report of the Joint

- National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Hypertension. 2003; 42(6):1206–1252. [PubMed: 14656957]
4. Federal Interagency Forum on Aging-Related Statistics. Older Americans 2012: Key Indicators of Well-Being. Washington, DC: Federal Interagency Forum on Aging-Related Statistics; 2012.
  5. Diabetes Prevention Program (DPP) Research Group. The Diabetes Prevention Program (DPP): description of lifestyle intervention. Diabetes Care. 2002; 25(12):2165–2171. [PubMed: 12453955]
  6. Cha NH, Seo EJ, Sok SR. Factors influencing the successful aging of older Korean adults. Contemp Nurse. 2012; 41(1):78–87. [PubMed: 22724909]
  7. Depp CA, Jeste DV. Definitions and predictors of successful aging: a comprehensive review of larger quantitative studies. Am J Geriatr Psychiatry. 2006; 14(1):6–20. [PubMed: 16407577]
  8. Rejeski WJ. Mindfulness: reconnecting the body and mind in geriatric medicine and gerontology. Gerontologist. 2008; 48(2):135–141. [PubMed: 18483425]
  9. Morone NE, Greco CM. Mind-body interventions for chronic pain in older adults: a structured review. Pain Med. 2007; 8(4):359–375. [PubMed: 17610459]
  10. Palta P, Page G, Piferi RL, et al. Evaluation of a mindfulness-based intervention program to decrease blood pressure in low-income African-American older adults. J Urban Health. 2012; 89(2):308–316. [PubMed: 22302233]
  11. Zeng W, Stason WB, Fournier S, et al. Benefits and costs of intensive lifestyle modification programs for symptomatic coronary disease in Medicare beneficiaries. Am Heart J. 2013; 165(5): 785–792. [PubMed: 23622916]
  12. Rybarczyk B, DeMarco G, DeLaCruz M, Lapidos S, Fortner B. A classroom mind/body wellness intervention for older adults with chronic illness: comparing immediate and 1-year benefits. Behav Med. 2001; 27(1):15–27. [PubMed: 11575169]
  13. Lorig KR, Sobel DS, Stewart AL, et al. Evidence suggesting that a chronic disease self-management program can improve health status while reducing hospitalization: a randomized trial. Med Care. 1999; 37(1):5–14. [PubMed: 10413387]
  14. Lorig KR, Ritter P, Stewart AL, et al. Chronic disease self-management program: 2-year health status and health care utilization outcomes. Med Care. 2001; 39(11):1217–1223. [PubMed: 11606875]
  15. Esch T, Fricchione GL, Stefano GB. The therapeutic use of the relaxation response in stress-related diseases. Med Sci Monit. 2003; 9(2):RA23–RA34. [PubMed: 12601303]
  16. Galvin JA, Benson H, Deckro GR, Fricchione GL, Dusek JA. The relaxation response: reducing stress and improving cognition in healthy aging adults. Complement Ther Clin Pract. 2006; 12(3): 186–191. [PubMed: 16835029]
  17. Jacquart J, Miller KM, Radossi A, et al. The effectiveness of a community-based mind-body group intervention for symptoms of depression and anxiety. Adv Mind Body Med. In press.
  18. Taylor AG, Goehler LE, Galper DI, Innes KE, Bourguignon C. Top-down and bottom-up mechanisms in mind-body medicine: development of an integrative framework for psychophysiological research. Explore (NY). 2010; 6(1):29–41. [PubMed: 20129310]
  19. Bhasin MK, Dusek JA, Chang BH, et al. Relaxation response induces temporal transcriptome changes in energy metabolism, insulin secretion and inflammatory pathways. PLoS One. 2013; 8(5):e62817. [PubMed: 23650531]
  20. Park ER, Traeger L, Vranceanu AM, et al. The development of a patient-centered program based on the relaxation response: the Relaxation Response Resiliency Program (3RP). Psychosomatics. 2013; 54(2):165–174. [PubMed: 23352048]
  21. King AC, King DK. Physical activity for an aging population. Public Health Rev. 2010; 32(2): 401–426.
  22. Geda YE, Roberts RO, Knopman DS, et al. Physical exercise, aging, and mild cognitive impairment: a population-based study. Arch Neurol. 2010; 67(1):80–86. [PubMed: 20065133]
  23. Physical Activity Guidelines Advisory Committee. Physical Activity Guidelines Advisory Committee Report, 2008. Washington, DC: US Dept of Health and Human Services; 2008.
  24. National Institute on Aging. Exercise and Physical Activity: Your Everyday Guide. Bethesda, MD: National Institute on Aging, National Institutes of Health, US Dept of Health and Human Services; 2011.

25. Williamson J, Pahor M. Evidence regarding the benefits of physical exercise. *Arch Intern Med*. 2010; 170(2):124–125. [PubMed: 20101006]
26. Everard KM, Lach HW, Fisher EB, Baum MC. Relationship of activity and social support to the functional health of older adults. *J Gerontol B Psychol Sci Soc Sci*. 2000; 55(4):S208–S212. [PubMed: 11584883]
27. Newsom JT, Schulz R. Social support as a mediator in the relation between functional status and quality of life in older adults. *Psychol Aging*. 1996; 11(1):34–44. [PubMed: 8726368]
28. Menec VH. The relation between everyday activities and successful aging: a 6-year longitudinal study. *J Gerontol B Psychol Sci Soc Sci*. 2003; 58(2):S74–S82. [PubMed: 12646596]
29. Perkins MM, Ball MM, Kemp CL, Hollingsworth C. Social relations and resident health in assisted living: an application of the convoy model. *Gerontologist*. 2013; 53(3):495–507. [PubMed: 23042689]
30. Siebert DC, Mutran EJ, Reitzes DC. Friendship and social support: the importance of role identity to aging adults. *Soc Work*. 1999; 44(6):522–533. [PubMed: 10568025]
31. Matz-Costa C, Besen E, Boone James J, Pitt-Catsoupes M. Differential impact of multiple levels of productive activity engagement on psychological well-being in middle and later life. *Gerontologist*. 2014; 54(2):277–289. [PubMed: 23213083]
32. Bandura, A. Self-efficacy. In: Weiner, IB.; Craighead, WE., editors. *Corsini Encyclopedia of Psychology*. Hoboken, NJ: John Wiley & Sons; 2010.
33. Kostka T, Jachimowicz V. Relationship of quality of life to dispositional optimism, health locus of control and self-efficacy in older subjects living in different environments. *Qual Life Res*. 2010; 19(3):351–361. [PubMed: 20146007]
34. Anderson ES, Winett RA, Wojcik JR, Williams DM. Social cognitive mediators of change in a group randomized nutrition and physical activity intervention: social support, self-efficacy, outcome expectations and self-regulation in the guide-to-health trial. *J Health Psychol*. 2010; 15(1):21–32. [PubMed: 20064881]
35. Holahan CK, Holahan CJ. Self-efficacy, social support, and depression in aging: a longitudinal analysis. *J Gerontol*. 1987; 42(1):65–68. [PubMed: 3794199]
36. Grembowski D, Patrick D, Diehr P, et al. Self-efficacy and health behavior among older adults. *J Health Soc Behav*. 1993; 34(2):89–104. [PubMed: 8277130]
37. Lawton, MP. The dimensions of morale. In: Kent, DP.; Kastenbaum, R.; Sherwood, S., editors. *Research, Planning, and Action for the Elderly: The Power and Potential of Social Science*. New York, NY: Behavioral Publications; 1972.
38. Lawton MP. The Philadelphia Geriatric Center Morale Scale: a revision. *J Gerontol*. 1975; 30(1): 85–89. [PubMed: 1109399]
39. Litwin H. The path to well-being among elderly Arab Israelis. *J Cross Cult Gerontol*. 2006; 21(1–2):25–40. [PubMed: 17103310]
40. Araki A, Murotani Y, Kamimiya F, Ito H. Low well-being is an independent predictor for stroke in elderly patients with diabetes mellitus. *J Am Geriatr Soc*. 2004; 52(2):205–210. [PubMed: 14728628]
41. Benito-León J, Louis ED, Rivera-Navarro J, Medrano MJ, Vega S, Bermejo-Pareja F. Low morale is associated with increased risk of mortality in the elderly: a population-based prospective study (NEDICES). *Age Ageing*. 2010; 39(3):366–373. [PubMed: 20299322]
42. Chesney MA, Neilands TB, Chambers DB, Taylor JM, Folkman S. A validity and reliability study of the coping-self-efficacy scale. *Br J Health Psychol*. 2006; 11:421–437. [PubMed: 16870053]
43. Colodro H, Godoy-Izquierdo D, Godoy J. Coping self-efficacy in a community-based sample of women and men from the United Kingdom: the impact of sex and health status. *Behav Med*. 2010; 36(1):12–23. [PubMed: 20185397]
44. Little RJ, D’Agostino R, Cohen ML, et al. The prevention and treatment of missing data in clinical trials. *N Engl J Med*. 2012; 367(14):1355–1360. [PubMed: 23034025]
45. Smith KW, Avis NE, Assmann SF. Distinguishing between quality of life and health status in quality of life research: a meta-analysis. *Qual Life Res*. 1999; 8(5):447–459. [PubMed: 10474286]

46. Cohen S, Herbert TB. Health psychology: psychological factors and physical disease from the perspective of human psychoneuroimmunology. *Annu Rev Psychol.* 1996; 47:113–142. [PubMed: 8624135]
47. Marks R, Allegrante JP, Lorig K. A review and synthesis of research evidence for self-efficacy-enhancing interventions for reducing chronic disability: implications for health education practice (part I). *Health Promot Pract.* 2005; 6(1):37–43. [PubMed: 15574526]
48. Strecher VJ, DeVellis BM, Becker MH, Rosenstock IM. The role of self-efficacy in achieving health behavior change. *Health Educ Q.* 1986; 13(1):73–92. [PubMed: 3957687]
49. Mendes de Leon CF, Seeman TE, Baker DI, Richardson ED, Tinetti ME. Self-efficacy, physical decline, and change in functioning in community-living elders: a prospective study. *J Gerontol B Psychol Sci Soc Sci.* 1996; 51(4):S183–S190. [PubMed: 8673647]

**Table 1**

## Sessions and Goals for the Healthy Aging Mind-body Intervention

Session Title	Goals
<b>Session 1: Start Where You Are, the Mind Body Connection</b>	<ul style="list-style-type: none"> <li>• Discussion of stress physiology and the mind-body connection</li> <li>• Identification of stress warning signs</li> <li>• Tips for successful aging</li> <li>• Explanation of self-monitoring diary sheets</li> <li>• Practice in eliciting the relaxation response (RR), CDs provided</li> <li>• Receipt of course materials</li> </ul>
<b>Session 2: It All Starts with the Breath</b>	<ul style="list-style-type: none"> <li>• Review of self-monitoring diary sheets</li> <li>• Practice in eliciting the RR</li> <li>• Discussion of relaxation practice—what worked, what didn't work</li> <li>• Explanation of minis; ie, brief elicitations of the RR to use throughout the day</li> <li>• Explanation of biodots: sensors placed on hand that measure skin temperature -- used for biofeedback during meditation sessions</li> <li>• Discussion of the attitude of gratitude</li> </ul>
<b>Session 3: Hurry Up and Relax</b>	<ul style="list-style-type: none"> <li>• Review of diary sheets and minis</li> <li>• Practice in eliciting the RR</li> <li>• Discussion of biodots</li> <li>• Introduction of the stress-hardiness characteristic and stress buffers</li> <li>• Explanation of mindfulness</li> </ul>
<b>Session 4: Yoga</b>	<ul style="list-style-type: none"> <li>• Review of diary sheets</li> <li>• Discussion of the health benefits of physical activity</li> <li>• Explanation of the elicitation of the RR through chair yoga and gentle stretching exercises</li> </ul>
<b>Session 5: Resiliency</b>	<ul style="list-style-type: none"> <li>• Practice in eliciting the RR</li> <li>• Discussion of the research on resiliency—rolling with life's punches</li> <li>• Discussion of the characteristics of resiliency: commitment, control, challenge, and community</li> <li>• Practice of an experiential exercise on creating meaning and purpose in life</li> </ul>
<b>Session 6: Change Your Mind, Change Your Mood—Part 1</b>	<ul style="list-style-type: none"> <li>• Practice in eliciting the RR</li> <li>• Discussion of cognitive restructuring—how thoughts affect the body</li> <li>• Discussion of the fact that stress is often caused by distorted, illogical, irrational thinking</li> <li>• Discussion of the replacement of irrational negative thoughts with more rational ones</li> </ul>
<b>Session 7: Change Your Mind, Change Your Mood—Part 2</b>	<ul style="list-style-type: none"> <li>• Introduction of a new method to elicit the RR</li> <li>• Discussion of the use of cognitive reappraisal as a way to build adaptation</li> <li>• Practice of the visual imagery exercise</li> <li>• Small-group discussion of cognitive-restructuring diary sheets</li> <li>• Discussion of positive beliefs as antidotes for negative thoughts and beliefs</li> <li>• Discussion of styles of communication</li> </ul>

Session Title	Goals
<b>Session 8: Nutrition</b>	<ul style="list-style-type: none"><li>• Practice in eliciting the RR</li><li>• Discussion: What is a healthy diet?</li><li>• Discussion: What should your plate look like?</li><li>• Discussion of eating for strong bones, a healthy heart, and an efficient immune system</li><li>• Discussion on preparation of food</li><li>• Discussion on sharing meals with friends</li><li>• Discussion: It's not just what you eat; it's also how you eat</li><li>• Discussion of the use of vitamins and supplements</li></ul>
<b>Session 9: Review and Relapse Prevention</b>	<ul style="list-style-type: none"><li>• Practice in eliciting the RR</li><li>• Review of the entire program</li><li>• Letter writing, with commitment to the changes the individual has made</li><li>• Provision of a shared meal</li><li>• Completion of postprogram questions</li></ul>

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 2**

Demographics of the Study's Participants (n=46)

<b>Characteristic</b>	<b>N (%)</b>	<b>Mean ± SD</b>
Age, y		75.5 ± 6.7
<b>Gender</b>		
Male	8 (17.4)	
Female	35 (76.1)	
Unreported	3 (6.5)	
<b>Race</b>		
White/Caucasian	41 (89.1)	
African American	1 (2.2)	
Unreported	4 (8.7)	
<b>Marital Status</b>		
Single	9 (19.6)	
Married	7 (15.2)	
Divorced or separated	10 (21.7)	
Widowed	16 (34.8)	
Unreported	4 (8.7)	
<b>Employment Status</b>		
Retired	34 (74)	
Part-time	3 (6.5)	
Full-time	3 (6.5)	
Disabled	2 (4.3)	
Unreported	4 (8.7)	

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript



**Table 3**

Results.

<b>Completer Analysis, n=41 for PGCMS and n=38 for CSES</b>				
	<b>Pre-intervention Mean (SD)</b>	<b>Postintervention Mean (SD)</b>	<b>Change Mean (SD)</b>	<b>p-value</b>
<b>PGCMS</b>	10.73 (4.15)	12.41 (4.15)	1.68 (2.94)	0.001
<b>CSES</b>	163.33 (43.73)	197.23 (39.80)	33.90 (36.30)	<0.001

  

<b>Sensitivity Analysis, n=46 for PGCMS and n=45 for CSES</b>				
	<b>Pre-intervention Mean (SD)</b>	<b>Postintervention Mean (SD)</b>	<b>Change Mean (SD)</b>	<b>p-value</b>
<b>PGCMS</b>	10.48 (4.15)	11.54 (4.80)	1.07 (3.30)	0.064
<b>CSES</b>	164.47 (43.47)	190.45 (43.14)	25.98 (38.16)	<0.001

The table shows the results of a completer analysis with paired t-tests and a Wilcoxon signed rank test for a sensitivity analysis, which shows an n = 45 for the CSES because one participant complete neither a pre- or a posttest questionnaire.