Brain Health & SeniorWISE

Memory Training + Yoga
Independent Older Adults

Graham J. McDougall Jr.
The University of Alabama
Capstone College of Nursing
SeniorWISE

Wisdom Is Simply Exploration
Centenarians are projected to increase from 70,000 to 700,000 in 2050.

No published studies of memory training plus yoga (McDougall et al. under review).

Intellectual engagement has indirect effects, such as opportunities to socialize and reduce emotional distress (JAMA, 2002).

The total estimated worldwide costs of dementia are $604 billion in 2010 (World Alzheimer Report, 2010)
Public Policy

The Decade of the Brain was a designation for 1990-1999 involving the Library of Congress, the National Institute of Health, and specifically the National Institutes of Mental Health to enhance public awareness of the benefits to be derived from brain research"
Brain Plasticity

The Discovery

- Brain is adaptable throughout life and can produce new cells in adulthood

Health Implications

- Maintaining Healthy Brain Function
- Boosting Brain Plasticity as Treatment
Brain Health

- Lifestyle behaviors--moderate alcohol consumption
- Physical health--exercise
- Emotional health--happiness
- Social engagement--volunteerism
- Intellectual pursuits--mental stimulation
- Confidence--efficient in some domain
<table>
<thead>
<tr>
<th>Term</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Buz!</td>
<td></td>
</tr>
<tr>
<td>Anti-Aging</td>
<td>56.8 M</td>
</tr>
<tr>
<td>Cognitive Reserve</td>
<td>25.1 M</td>
</tr>
<tr>
<td>Cognitive Stimulation</td>
<td>11.6 M</td>
</tr>
<tr>
<td>Brain Fitness</td>
<td>11.2 M</td>
</tr>
<tr>
<td>Plasticity</td>
<td>8.93 M</td>
</tr>
<tr>
<td>Neurogenesis</td>
<td>1.53 M</td>
</tr>
<tr>
<td>Neurobics</td>
<td>54,000</td>
</tr>
<tr>
<td>Use It or Lose It</td>
<td>26,200</td>
</tr>
</tbody>
</table>
Fear of Senior Moments!

Of 801 adults surveyed, between the ages of 45-65, 43% expressed concern about Alzheimer’s disease following heart attack, cancer, and stroke (Newsweek Poll, 2001)

Web-based interviews conducted with 1,009 Baby Boomers regarding their awareness and knowledge of AD. Overall, 80-95% were unprepared emotionally and financially, but would be willing to participate in drug trials since current treatments are inadequate (Accelerate Cure/Treatments for AD, 2006)
Prevalence of Moderate & Severe Memory Impairment – HRS Data

- Men
- Women
Memory Self-Efficacy

- Beliefs about one's capability to use memory effectively in various situations (Hertzog, 1989)

- An individual’s belief regarding a specific set of memory tasks arranged hierarchically, with cognitive ratings for each level and generality for comparison with other similar tasks (Bandura, 1989; Berry, West, & Dennehey, 1989)
Memory Self-Efficacy

Figure 1. Memory Self-Efficacy Scores by Age Group Measured with the 50-item MSEQ (N = 686)

- N = 177 (less than 70)
- N = 353 (70-79)
- N = 137 (80-89)
- N = 19 (90-99)
SeniorWISE History

- **Version I**—Intervention Development & testing with 4 quasi-experimental studies, 1996-1998 (N=175)

- **Version II**—Phase III randomized clinical trial (R01 AG15384), Memory vs. Health training, 2001-2006 (N = 265)

- **Version III**—Translation of SW vs. Diabetic Health training in Arkansas, CDC (R18 DP001145), 2007-2012 (N = 228). D. West, PI

- **Version IV**—Quasi experimental, Memory + Yoga training, 2010-2012 (N = 133)
SeniorWISE-Version IV
Wisdom Is Simply Exploration

Wisdom Is Simply Exploration
SeniorWISE
(Wisdom Is Simply Exploration)

- Yoga Training
- Memory Self-Efficacy
- Strategy Training
- Health Promotion
Yoga Training

A combination of ballistic and static stretches that borrowed from different yoga disciplines modified to each participant’s skill level or limitation.

Each class began with seated stretching, in conjunction with focused breathing; “asana” or posture.

Standing static and ballistic stretches were at times utilized.

Culminated in a guided meditation, visualization-oriented, relaxation exercise utilizing mountain, river, and ocean scenarios.

These scenarios would conclude with 10 breaths counted off by the instructor performed in unison.
Acknowledgement

St. David’s Community Health Foundation
Austin, TX
SeniorWISE Team

Graham J McDougall Jr, PhD, RN-PI

Vonnette Austin-Wells, PhD-Col

Research Assistants
Ernest Wayde, PhD & Katy Ford, MA
Neli Altuna, Andy Baum, Stephen Brotherman, Ryan Glidewell, Melissa Le, Brandon Rhodes, Jay Ross

Consultants
Albert Bandura, PhD
Bert Hayslip, PhD
George Rebok, PhD, & David E. Vance, PhD
Sample

4 retirement communities in Central Texas

N = 133 (83 post-tested)

98 (73.7 %) female, 114 (85.7 %) white, 6 (4.5%) black, 2 (.8 %)

The completed participants were 10% minorities, had 15.55 years of schooling and were 80.70 years of age
Direct Assessment of Functional Status Extended

- IADL performance in the following domains: Communication, Financial, Shopping, and Medication Skills
- Consists of 55 items in the DAFS-E, 20 of which are in the Medication Skills domain

Loewenstein, 1989; McDougall et al., 2010; McDowd, McDougall, Han, & Gregory, 2010
Everyday Memory Performance

- The Rivermead Behavioural Memory Test (RBMT) is a standardized measure of everyday memory functioning by providing analogs of situations met in daily life.

## Dropouts vs. Completers

<table>
<thead>
<tr>
<th></th>
<th>(n=50)</th>
<th>(n=83)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>13.20</td>
<td>14.86</td>
<td>.03</td>
</tr>
<tr>
<td>Classes attended</td>
<td>2.11</td>
<td>7.63</td>
<td>.01</td>
</tr>
<tr>
<td>IADLs</td>
<td>45.70</td>
<td>48.41</td>
<td>.04</td>
</tr>
</tbody>
</table>
Memory Performance Scores

Classification at Baseline

- **Normal**
  - (22-24)
  - N= 2

- **Poor**
  - (17-21)
  - N=27

- **Moderately Impaired**
  - (10-16)
  - N= 44

- **Severely Impaired**
  - (0-9)
  - N= 10
# Performance Variables

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory (Rivermead)</td>
<td>14.86</td>
<td>16.93</td>
<td>.00</td>
</tr>
<tr>
<td>Cognition (MMSE)</td>
<td>27.17</td>
<td>27.49</td>
<td>NS</td>
</tr>
<tr>
<td>IADLs (DAFS-E)</td>
<td>48.43</td>
<td>50.34</td>
<td>.00</td>
</tr>
</tbody>
</table>
## Self-Report Variables

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depression (CES-D)</strong></td>
<td>10.06</td>
<td>8.26</td>
<td>.003</td>
</tr>
<tr>
<td><strong>Anxiety (STAI)</strong></td>
<td>46.55</td>
<td>46.59</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Memory Self-Efficacy</strong></td>
<td>59.77</td>
<td>71.72</td>
<td>.00</td>
</tr>
<tr>
<td><strong>Memory Complaints</strong></td>
<td>2.88</td>
<td>2.95</td>
<td>.05</td>
</tr>
</tbody>
</table>
## Memory Performance Groups

<table>
<thead>
<tr>
<th></th>
<th>Time 1 (n=83)</th>
<th>Time 2 (n=83)</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>2</td>
<td>15</td>
<td>+650.00%</td>
</tr>
<tr>
<td>Poor</td>
<td>27</td>
<td>34</td>
<td>+25.93%</td>
</tr>
<tr>
<td>Moderately Impaired</td>
<td>44</td>
<td>28</td>
<td>-36.36%</td>
</tr>
<tr>
<td>Severely Impaired</td>
<td>10</td>
<td>6</td>
<td>-40.00%</td>
</tr>
</tbody>
</table>
### Memory Performance Groups in SeniorWISE Version II

<table>
<thead>
<tr>
<th></th>
<th>Time 1 (n=135)</th>
<th>Time 2 (n=127)</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>36</td>
<td>44</td>
<td>+22%</td>
</tr>
<tr>
<td>Poor</td>
<td>72</td>
<td>67</td>
<td>-7%</td>
</tr>
<tr>
<td>Moderately Impaired</td>
<td>24</td>
<td>13</td>
<td>-46%</td>
</tr>
<tr>
<td>Severely Impaired</td>
<td>3</td>
<td>3</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>No Yoga 29%</td>
<td>Yoga 48%</td>
<td>Net Change</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------</td>
<td>----------</td>
<td>------------------</td>
</tr>
<tr>
<td>Normal</td>
<td>44</td>
<td>15</td>
<td>+22 vs. +650%</td>
</tr>
<tr>
<td>Poor</td>
<td>67</td>
<td>34</td>
<td>-7 vs. +26%</td>
</tr>
<tr>
<td>Moderately Impaired</td>
<td>13</td>
<td>28</td>
<td>-46 vs. -37%</td>
</tr>
<tr>
<td>Severely Impaired</td>
<td>3</td>
<td>6</td>
<td>0 vs. -40%</td>
</tr>
</tbody>
</table>
Conclusions

- Combined intervention promoted healthy brain function and boosted plasticity
- Yoga + SeniorWISE may benefit older adults with mild cognitive impairment
- Octogenarians have the cognitive reserve to remediate daily function with compensatory strategies
- Transfer of learning occurred as demonstrated by a significant increase in performance-based IADLs
What Works?

- Anti-Oxidants
- Confidence-Building
- Mental Stimulation
- Physical Activity
- Relaxation Techniques
- Social Engagement
- Moderate Alcohol Consumption
Preventing Alzheimer’s Disease and Cognitive Decline

- Firm conclusions cannot be drawn about the association of modifiable risk factors with cognitive decline or Alzheimer's disease
- There is an absence of highly reliable consensus-based diagnostic criteria for cognitive decline, mild cognitive impairment, and Alzheimer's disease, and the available criteria have not been uniformly applied
- Insufficient evidence to support the use of pharmaceutical agents or dietary supplements to prevent cognitive decline or Alzheimer's disease
- However, ongoing additional studies including (but not limited to) antihypertensive medications, omega-3 fatty acid, physical activity, and cognitive engagement may provide new insight into the prevention or delay of cognitive decline or Alzheimer's disease.

*NIH Consensus State Sci Statements. 2010 Apr 28;27(4).*
Cognitive Stimulation Evidence

- Firm conclusions cannot be drawn about the association of any modifiable risk factor with cognitive decline or AD
- Evidence is insufficient to support the use of pharmaceutical agents or dietary supplements to prevent cognitive decline associated with AD

*(NIH State-of-the-Science on Preventing Alzheimer’s Disease and Cognitive Decline, 2010)*
By the time you are forty, all available drawers are filled.
You learn something new,
Something else gets thrown out.

Special thanks to cartoonist R. Chast. and The New Yorker.
People think they can get around this by cramming stuff into already-in-use drawers, but they’re sadly mistaken.
And in the end, everything turns into material whose only function is to keep one’s head from collapsing in on itself.

<table>
<thead>
<tr>
<th>Styrofoam Peanuts</th>
<th>Goose Down</th>
<th>Sawdust</th>
<th>Wood Chips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dried Beans</td>
<td>Shredded Newspaper</td>
<td>Gravel</td>
<td>Cotton Batting</td>
</tr>
<tr>
<td>Concrete</td>
<td>Silicone</td>
<td>Kapok</td>
<td>Plaster of Paris</td>
</tr>
</tbody>
</table>
Benefits of Cognitive Activity

- Generates Neurons and Synapses
- Builds Psychological Confidence
- Promotes Mental Discipline
- Enhances Intellectual Sharpness
- Develops Cognitive Vigor