Yoga & Fall Prevention
Why Fall Prevention

2016 Wisconsin Healthy Aging Summit
Why Yoga?
## Yoga Statistics

Source: NAMAST, YIAS, Livestrong, Yoga Journal, Aug. 1st 2015

http://www.statisticbrain.com/yoga-statistics/

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Americans who practice Yoga</td>
<td>15,275,000</td>
</tr>
<tr>
<td>Percent female</td>
<td>72.2%</td>
</tr>
<tr>
<td>Percent male</td>
<td>27.8%</td>
</tr>
<tr>
<td>Percent who earn more than $75,000 annually</td>
<td>44%</td>
</tr>
<tr>
<td>Percent who earn more than $100,000 annually</td>
<td>24%</td>
</tr>
<tr>
<td>Percent between the ages of 18-34</td>
<td>40.6%</td>
</tr>
<tr>
<td>Percent between the ages of 35-54</td>
<td>41%</td>
</tr>
<tr>
<td>Percent over 55</td>
<td>18.4%</td>
</tr>
<tr>
<td>Percent who are college graduates</td>
<td>71.4%</td>
</tr>
</tbody>
</table>

### Yoga by Location

- Percent of practitioners that live on the West Coast: 20%
- Percent of practitioners that live in the Northeast: 30%
- Percent of practitioners that live in the Midwest including Ohio: 30%
- Other parts: 20%

### Yoga Industry Growth Statistics

- Amount spent annually in the US on yoga products: $10,300,000,000
- Percent increase on yoga product spending over the last 5 years: 87%
- Average annual increase of the number of people who practice yoga: 20%
Some possible effects yoga has on Fall Risk Factors, Including:

• Strength

• Balance

• The way a person Walks
The Research on Strength and Gait

Yoga is as Good as Stretching-Strengthening Exercises in Improving Functional Fitness Outcomes: Results From a Randomized Controlled Trial.
Gothe NP\textsuperscript{1}, McAuley E\textsuperscript{2}.

BACKGROUND:
Despite yoga's popularity, few clinical trials have employed rigorous methodology to systematically explore its functional benefits compared with more established forms of exercise. The objective of this study was to compare the functional benefits of yoga with the conventional stretching-strengthening exercises recommended for adults.

CONCLUSIONS:
These data suggest that regular yoga practice is just as effective as stretching-strengthening exercises in improving functional fitness. To our knowledge, this is the first study to examine functional benefits of yoga in comparison with stretching-strengthening exercises in sedentary, healthy, community-dwelling older adults. These findings have clinical implications as yoga is a more amenable form of exercise than strengthening exercises as it requires minimal equipment and can be adapted for individuals with lower levels of functioning or disabilities.

Yoga therapy and ambulatory multiple sclerosis Assessment of gait analysis parameters, fatigue and balance.
Guner S\textsuperscript{1}, Inanici F\textsuperscript{2}.

BACKGROUND AND OBJECTIVE:
Gait impairment, falls due to balance problems and fatigue are among the most important complaints in patients with multiple sclerosis (MS) and cause significant functional limitation. Use of complementary and alternative medicine (CAM) to help symptom management and to improve quality of life is growing among MS patients. Yoga is widely used as one of these CAM interventions, however, the number of studies that show the efficacy of yoga training in MS is inadequate. In this study, we aimed to evaluate the effects of a short term yogaprogram on fatigue, balance and gait in patients with MS.

CONCLUSION:
Yoga therapy is a safe and beneficial intervention for improving fatigue, balance and spatiotemporal gait parameters in patients with MS. Further studies with a larger sample size and longer follow-up will be needed to evaluate the long term effects of yoga therapy.


PMID: 25603746

2016 Wisconsin Healthy Aging Summit
The Research on Balance

Comparative impacts of Tai Chi, balance training, and a specially-designed yoga program on balance in older fallers.

Ni M\textsuperscript{1}, Mooney K\textsuperscript{2}, Richards L\textsuperscript{2}, Balachandran A\textsuperscript{1}, Sun M\textsuperscript{1}, Harrell K\textsuperscript{1}, Pollaumpai M\textsuperscript{1}, Signorile JP\textsuperscript{3}.

**OBJECTIVE:** To compare the effect of a custom-designed yoga program with 2 other balance training programs.

**CONCLUSIONS:**

*Yoga was as effective as Tai Chi and standard balance training for improving postural stability and may offer an alternative to more traditional programs.*


Poststroke balance improves with yoga: a pilot study.

Schmid AA\textsuperscript{1}, Van Puymbroeck M, Altenburger PA, Schalk NL, Dierks TA, Miller KK, Damush TM, Bravata DM, Williams LS.

**BACKGROUND AND PURPOSE:** Balance impairment is common after stroke; modified yoga may be able to improve balance and other important post stroke variables. Scientific-evidence is needed to support such treatment interventions. The purpose of this study was to assess the impact of a yoga-based rehabilitation intervention on balance, balance self-efficacy, fear of falling (FoF), and quality of life after stroke.

**CONCLUSIONS:**

A group yoga-based rehabilitation intervention for people with chronic stroke has potential in improving multiple post stroke variables. Group yoga may be complementary to rehabilitation, may be possible in medical-based and community-based settings, and may be cost-effective. Further testing of group yoga-based rehabilitation interventions is warranted.

Research on Fall rates

Yoga improves balance and flexibility but has unknown effect on falls in adults older than 60

Clinical Question
In adults over 60 years of age, does yoga prevent falls?

Bottom Line
Adults participating in yoga are likely to experience small improvements in balance and moderate improvements in mobility. However, it is unclear if this translates into fall prevention. (LOE = 1a)

Reference

Study Design: Meta-analysis (randomized controlled trials)

Funding: Government

Setting: Population-based

Allocation: Unknown

Synopsis
These authors searched multiple databases to identify randomized trials that evaluated yoga’s effect on balance in adults older than 60 years. Two authors independently determined which studies to include, assessed each included study’s methodologic quality, and resolved disagreements by discussion with third member of the team. They included 6 small studies with 307 participants. Overall, the studies were of modest quality. Five of the studies took place in communities; one was in a residential facility for the elderly. All studies used a certified yoga instructor and all reported adverse events. Overall, yoga participants experienced small improvements in balance and modest improvements in mobility. One patient had a fall during a yoga session, the remainder reported mild events, if any: knee pain, low back pain, minor muscle strain. None of the studies reported the rate of falls outside of yoga class. The authors don’t assess the potential for publication bias. Given the small number of participants, this is a serious concern.

Henry C. Barry, MD, MS
Professor
Michigan State University
Can Yoga Reduce Fall Frequency in Elders? - A Pilot Study

Paul D. Smith, MD; Paul Moss, E-RTY 200, LMT; Nade Christopher, PT, OCS
Upland Hills Health, University of Wisconsin Department of Family Medicine
May 2013 - January 2014

Background:
- 1 in 3 people over age 65 will fall each year
- Falls are the leading cause of injury death in adults over the age of 64
- Falls are the most common cause of nonfatal injuries and hospital admissions for trauma over the age of 64
- Yoga has a variety of health benefits:
  - Improved balance
  - Core body strength
  - Postsynaptic

Specific Poses:
- Interventions poses (asanas) were recorded for both the home exercise and class participation

Project Design:
- A convenience sample of men and women over age 59 were enrolled
- Intervention:
  - Hatha Yoga (Alignment body)
  - Pose focus was improving core strength and balance
  - An 8-week yoga program of weekly group classes
  - A home yoga practice of 5 poses, 10-15 minutes per day, 3 times per week

Evaluation:
- Balance and strength assessment: 30 Second Chair Stands and FICSIT-4 score
- Pre- and post-intervention surveys including the Tinetti Falls Efficacy Scale

Results:
- Enrolment: 21 subjects screened, 20 started and 19 (95%) completed
- Assessment: significant changes in 30 Second Chair Stand (P<.05), no significant changes in FICSIT-4 (P=NS)

Answers Raise More Questions:
- PT Assessment Observation: Does the time of day for pre- and post testing or environmental factors (winter in Wisconsin) cause variation in performance?
- Platform Effect: Does challenging subjects to progress in pose difficulty increase improvement in balance and decrease falls frequency?
- 15 of 20 subjects (75%) scored 40 or better (18 max) on FICSIT-4. With a ceiling effect of FICSIT-4, are these better indicated for predicting balance recovery or falls prevention, such as the anterior-posterior reach test?

Next Steps:
- A collaborative feasibility study is in progress with UW-Madison: Department of Family Medicine, Wisconsin Institute of Healthy Aging and The Aging and Disability Resource Center of Southwest Wisconsin.
- A wait list randomized trial of yoga’s effect for fall prevention, including a potential multi-site collaboration is seeking partners and funding for 2016.

Contact:
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(608) 469-5784
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References:
- FICSIT-4: Falls Incidence and Outcome Study Tool.
- Tinetti Falls: Tinetti Gait and Balance Test.
- Physical Examination Score.
- 30 Second Chair Stand: 30 Second Chair Stand.
- FICSIT-4: Falls Incidence and Outcome Study Tool.
- Tinetti Falls: Tinetti Gait and Balance Test.
- Physical Examination Score.
- 30 Second Chair Stand: 30 Second Chair Stand.
- FICSIT-4: Falls Incidence and Outcome Study Tool.
- Tinetti Falls: Tinetti Gait and Balance Test.
ADRC Study Design

• **Title:** Yoga’s effect on fall risk factors (balance, strength and the way a person walks) in the rural, older adult population. A feasibility study.

• **Timeframe:** April 2014 - April 2016

• **Structure:** 41 adults over age 59 were enrolled and 38 were assessed in an 8 week yoga program with bi-weekly group classes and home yoga practice 5 times per week.

• **Academic Team:**
  - **Principal Investigator:** Irene Hamrick MD, Department of Family Medicine, University of Wisconsin-Madison
  - **Academic Consultant:** Paul Smith MD, Department of Family Medicine, University of Wisconsin-Madison
  - **Yoga Consultant and Project Manager:** Paul Mross RYT, LMT
  - **Physical Therapist:** Nate Christopher PT, OCS2 Upland Hills Health Hospital, Dodgeville, WI

• **Community Team:**
  - **ADRC of Southwest Wisconsin:** Mary Mezera, Rebecca Wetter and Darla Burton
  - **Advisory Board:** Alvina Sturz, Dave Pearson, Anne Bachner, Carol Aultman, Leann White, Jean Slapka, Jerry Umbehaun

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2016 Wisconsin Healthy Aging Summit
Tools Developed from the ADRC Study: Needs Assessment Survey Data

In a survey of 225 older, rural adults; 176 responded to this question: What would stop you from trying yoga?

<table>
<thead>
<tr>
<th>#</th>
<th>Answer</th>
<th>Response</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Classes cost too much</td>
<td>57</td>
<td>32%</td>
</tr>
<tr>
<td>2</td>
<td>I don't have the time</td>
<td>44</td>
<td>25%</td>
</tr>
<tr>
<td>6</td>
<td>I'm too out of shape to do yoga</td>
<td>44</td>
<td>25%</td>
</tr>
<tr>
<td>10</td>
<td>I need more information about it</td>
<td>42</td>
<td>24%</td>
</tr>
<tr>
<td>7</td>
<td>It is not offered near me</td>
<td>41</td>
<td>23%</td>
</tr>
<tr>
<td>3</td>
<td>I can't get to a location that has yoga classes</td>
<td>40</td>
<td>23%</td>
</tr>
<tr>
<td>11</td>
<td>Health issues makes me think I cannot do yoga. (Optional) Please list;</td>
<td>39</td>
<td>22%</td>
</tr>
<tr>
<td>5</td>
<td>I'm too old to do yoga</td>
<td>25</td>
<td>14%</td>
</tr>
<tr>
<td>8</td>
<td>I'm unsure about trying something new</td>
<td>20</td>
<td>11%</td>
</tr>
<tr>
<td>13</td>
<td>Other. Please describe;</td>
<td>10</td>
<td>6%</td>
</tr>
<tr>
<td>12</td>
<td>There may not be others like me in the class. (Optional) Please list;</td>
<td>8</td>
<td>5%</td>
</tr>
<tr>
<td>9</td>
<td>This goes against my religious beliefs</td>
<td>7</td>
<td>4%</td>
</tr>
<tr>
<td>4</td>
<td>I perceive yoga to be gender specific</td>
<td>7</td>
<td>4%</td>
</tr>
</tbody>
</table>

Source: Yoga’s Effect on Fall Risk Factors in the Rural, Older Adult Population; an Academic/Community Partnership. Needs Assessment
ADRC Study, Needs Assessment Survey Data

Branding

- 25% said I am too out of shape to do yoga
- 22% said health issues make me think I cannot do yoga
- 14% said I am too old to do yoga

Source: Yoga’s Effect on Fall Risk Factors in the Rural, Older Adult Population; an Academic/Community Partnership. Needs Assessment Survey
ADRC Study, Needs Assessment Survey Data

Accessibility

• 32% said classes cost too much

• 23% said it is not offered near me

Source: Yoga’s Effect on Fall Risk Factors in the Rural, Older Adult Population; an Academic/Community Partnership. Needs Assessment Survey
PT Data:

This is raw data, which has not been peer reviewed

There was a statistically significant improvement on the Functional Gait Analysis

Improvements in balance included single leg balance and standing forward reach
Confidence Data:

This is raw data, which has not been peer reviewed

Maximal confidence increased *with indoor and outdoor activities* using

- Tinetti Falls Efficacy scale
- ABC (Activities-specific Balance Confidence Scale) Fear of Falling scale
Fall Frequencies:

*This is raw data, which has not been statistically analyzed or peer reviewed*

**Significant reduction** in number of falls:

6-months before the study:

- 15 participants reported a total of 27 falls

6 months from the start of the study

- 6 participants sustaining 8 falls
Feasibility Study:

Other outcomes:

- Video developed with UW-Platteville
- Handbook

- The intervention was proven safe!
Study Quotes:

“I thank you for the falls I won't have because of this (class).”

“Getting dressed much easier, especially putting on trousers. Before class, I had to either sit or lean against furniture, now (I’m) able to do without.”

“An hour of peace, friends and doing good for the body and mind.”

“It was a good experience and good exposure to yoga. Very positive, upbeat and non-threatening. I felt I had a higher quality of sleep while taking the classes.”

“(Our Swiss choir went)... to do a concert and I was asked to do a Yodel and I thought my breathing was so improved just because of the Yoga these past weeks that I have been in class.”
Next Steps

✓ Randomized Study
  • Statewide
  • Rural
  • Diverse Communities

✓ Potential Multi-site Collaboration

✓ Dissemination
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3 Key poses in home study

CHAIR

TREE

HIGH LUNGE