A Pilot Study of the Effects of an 8-Week Integrative Yoga Program on Function and Quality of Life in Persons with Moderate Disability Related to Multiple Sclerosis

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Background

- Many persons with MS seek out and utilize Complementary and Alternative Medicine therapies. (Stoll, Nieves, Tabby & Schwartzman, 2012)

- **12-31%** of persons with MS surveyed have participated in yoga. (Berkman, Pignotti, Cavallo & Holland, 1999; Esmonde & Long, 2008; Nayak, Mathies, Schoenberger & Shiflett, 2003; Schwarz, Knorr, Geiger & Flackenecker, 2008; Stuifbergen & Harrison, 2003)

- **60-80%** reported that yoga was helpful. (Esmonde & Long, 2008; Stuifbergen & Harrison, 2003)

- There is much anecdotal evidence of the benefits of yoga, but little research that substantiates its use.
Background

- Previous studies of yoga for persons with MS found positive effects on:
  - Balance (Ahmadi et al, 2010; Salgado et al, 2013)
  - Walking ability (Ahmadi et al 2010)
  - Strength (Salgado et al, 2013)
  - Respiratory function (Salgado et al, 2013)
  - Selective attention (Velikonja, Ćurić, Ožura & Jazbec, 2010)

- Interventions varied widely

- Some descriptions of interventions limit reproducibility

Purpose

- Develop a reproducible yoga intervention program, designed specifically for persons with moderate disability related to MS

- Conduct a pilot trial of the intervention to determine:
  - Feasibility
  - Effects on physical performance
  - Effects on quality of life
Development of the Yoga Intervention Protocol: A Modified Delphi Panel Process

Panel Recruitment

- Health care providers and scientists
- Yoga researchers, therapists and instructors
- Persons with MS who teach and/or practice yoga

Survey Round 1

- Panelist demographics
- Identification and prioritization of components of a relevant program

Survey Round 2

- Timing and order of class components
- Static vs. progressive program
- Specific practices and ability-based modification

Survey Round 3

- Feedback and consensus on intervention framework

The Yoga Intervention Protocol

- Two 90-minute-long classes per week for 8 weeks
- Planned progressions included in the protocol
- Classes were taught by two instructors and one assistant
- Home practice encouraged

<table>
<thead>
<tr>
<th>Component</th>
<th>Duration</th>
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<tbody>
<tr>
<td>Philosophy</td>
<td>10 minutes</td>
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<tr>
<td>Pranayama/Breathing</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Asanas/Postures</td>
<td>40 minutes</td>
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<tr>
<td>Relaxation practice</td>
<td>10 minutes</td>
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<tr>
<td>Meditation</td>
<td>10 minutes</td>
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Participant Characteristics

- 15 women with confirmed diagnosis of MS

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<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Range</th>
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<tbody>
<tr>
<td>Age (years)</td>
<td>53.5</td>
<td>34-64</td>
</tr>
<tr>
<td>Years since diagnosis</td>
<td>13.9</td>
<td>2-26</td>
</tr>
<tr>
<td>Disease Severity*</td>
<td>4.67</td>
<td>3-6</td>
</tr>
</tbody>
</table>

* Disease severity measured with the self-report of MS disease severity published by Kolbelt and colleagues (Kobelt G, Berg J, Lindgren P, Jönsson, 2006)

Outcomes: Physical Performance Measures

- **MS Functional Composite components**
  - 25’ timed walk test (25TWT)
  - 9-hole peg test dominant (9HPT-dom) and non-dominant (9HPT-non)
  - 3-second paced serial addition test (PASAT-3)

- **6-minute walk test (6MWT)**

- **5-times sit-to-stand test (5STS)**

- **Multidirectional reach test (MDRT)**
Outcomes: Quality of Life/Participation Measures

- **MS Quality of Life Inventory (MSQLI)**
  - Short Form Health Survey (SF-36)
  - Modified Fatigue Impact Scale (MFIS)
  - MOS Pain Effects Scale (PES)
  - Sexual Satisfaction Scale (SSS)
  - Bladder Control Scale (BLCS)
  - Bowel Control Scale (BWCS)
  - Impact of Vision Impairment Scale (IVIS)
  - Perceived Deficits Questionnaire (PDQ)
  - Mental Health Inventory (MHI)
  - Modified Social Support Survey (MSSS)

- **12-item MS Walking Scale (MSWS-12)**

Methods: Study Design

- Single group pilot study with no control group

- Three measurement points
  - Before intervention (T0)
  - Immediately after intervention (T1)
  - 8-week follow-up (T2)
Method: Statistical Analyses

- Statistical analyses
  - Normally distributed data was analyzed with repeated-measures analysis of variance
  - Non-normally distributed data was analyzed with Friedman’s test
  - Appropriate post-hoc tests were utilized to determine changes between periods (T0-T1, T0-T2, T1-T2)

Results: Feasibility

- Feasibility and safety of this intervention was demonstrated
  - 14 participants completed the study and data collection at all three time points
  - 1 participant withdrew after participating in a single yoga session (not MS related)
  - Overall class attendance was very high (89%)
  - Adverse events were not MS-related
Results: MSFC Components

T25WT

9HPT – Dom

9HPT – Non

Results: Other Physical Performance Measures

MDRT

5STS

6MWT

*p<0.05 T0 to T1
†p<0.05 T0 to T2
Results: Health-Related Quality of Life

- SF-36 Physical
- SF-36 Mental
- MFIS
- FES
- SSS
- BLC5
- BWCS
- IVIS
- PDQ
- MH1
- MSSS
- MSWS-12

Results: Other Results (Pending)

- Circulating immune and neuroendocrine biomarkers
  - Most well very low or undetectable
  - Significant decreases in IL-6 and C Reactive Protein
  - Significant increase in IL-8
  - A significant increase from T0-T1, then a significant decrease (below T0) from T1-T2

- Gene expression

- Detailed analysis of temporal-spatial gait parameters
Discussion and Conclusions

- The intervention is feasible

- Improvements were found in a number of activity- and participation-level outcomes

- In general, improvements were more persistent at follow-up for physical performance than self-reported outcomes

However...

Discussion and Conclusions

- Interpret these results with caution
  - Small sample size
  - No comparison/control group

- A larger randomized controlled trial is needed to determine intervention-specific results
  - Comparing the program to other exercise interventions
  - Examining separate effects of specific facets of the program
Acknowledgements

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References


