

## EFFECTS OF AN 8-WEEK SELF-EFFICACY PLUS EXERCISE INTERVENTION ON PHYSICAL ACTIVITY, QUALITY OF LIFE, AND FATIGUE IN AN INDIVIDUAL WITH PROGRESSIVE MS

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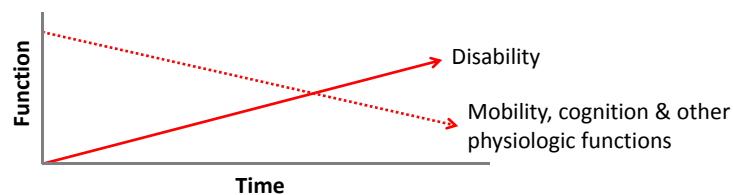
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### Background

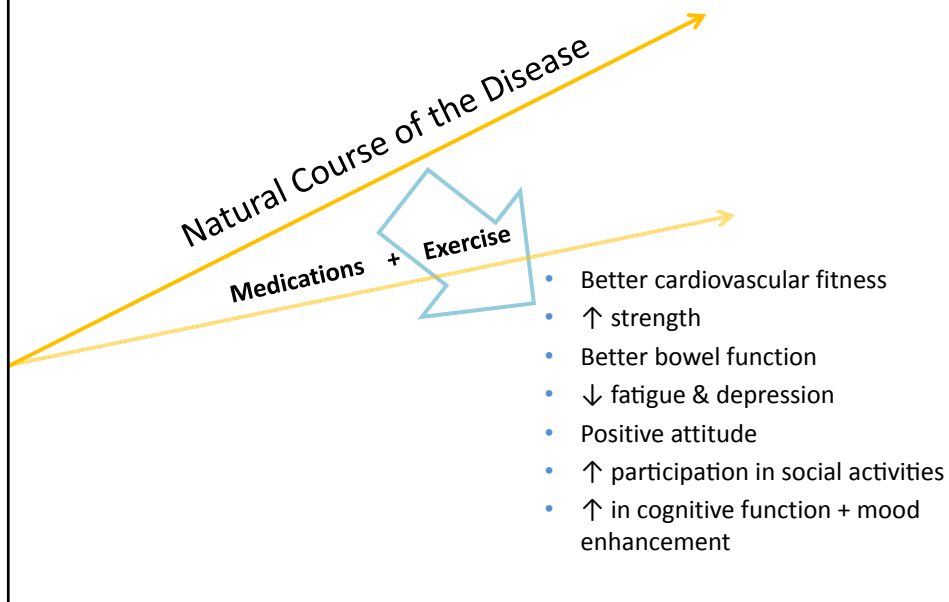
Multiple Sclerosis (MS) is characterized by an **unpredictable disease course**



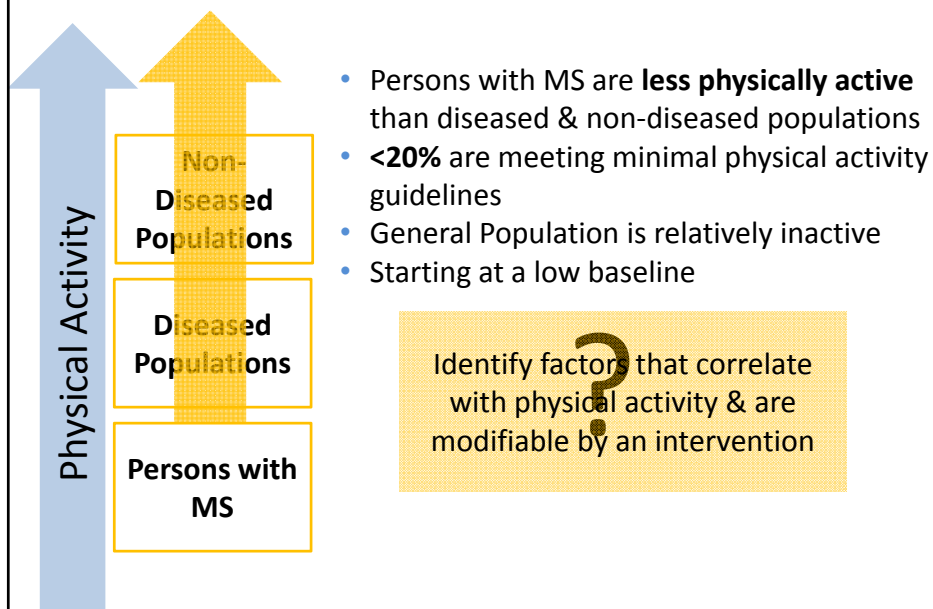
**Persons with MS are...**

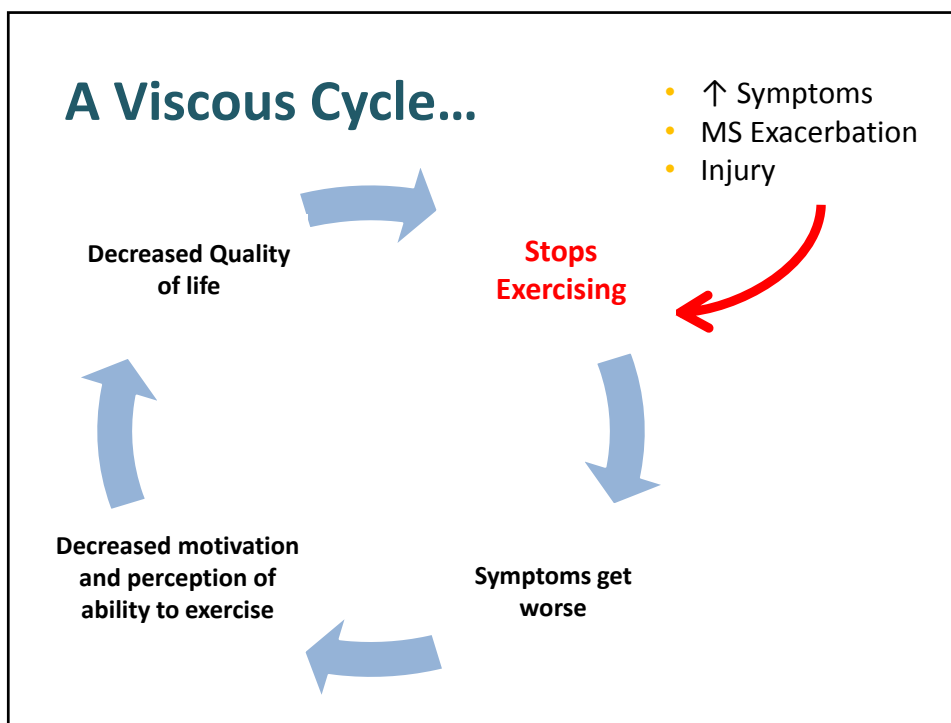
- Faced with many physical + psychological challenges
- Susceptible to non-adherence to health promoting behaviors secondary to many barriers to adherence

## Background - Role of Exercise in MS



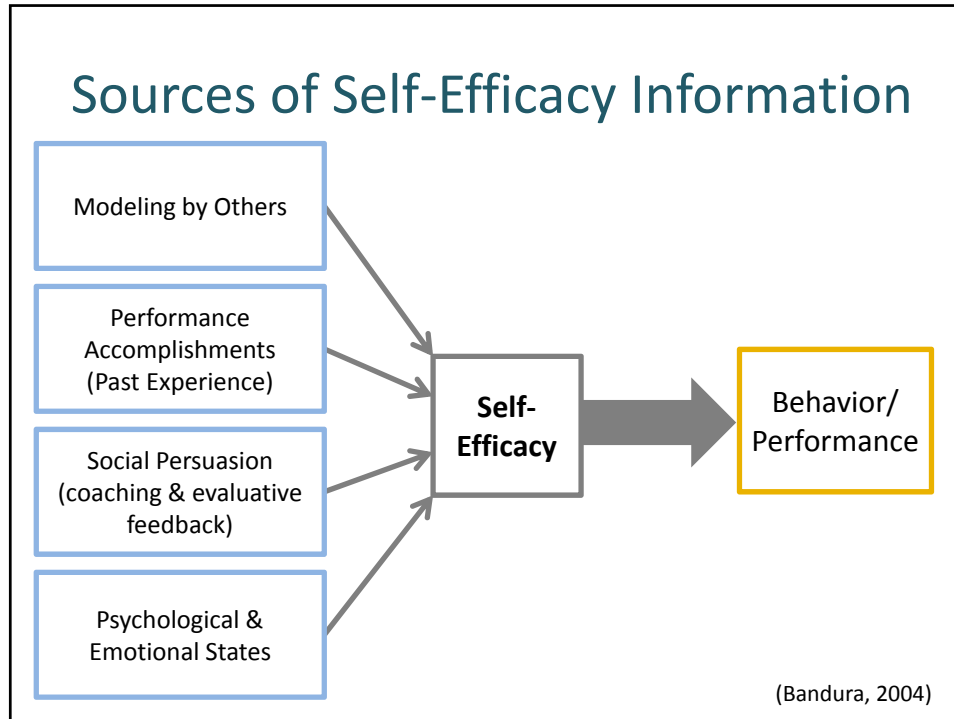
## Background - Physical Activity





## Self-Efficacy

- Extent or strength of **one's belief in one's own ability** to complete tasks & reach goals (*Bandura, 2004*)
- Persons with MS with **high self-efficacy** report higher levels of physical activity (*Motl, McAuley, Doerksen, Hu, & Morris, 2009*)
- Emerging research on self-efficacy promoting interventions to increase physical activity in MS (*Jongen & Ruimschotel, 2014; McAuley et al., 2007; Motl, Długonski, Wójcicki, McAuley, & Mohr, 2011; Motl et al., 2006; Motl & Snook, 2008; Suh, Joshi, Olsen, & Motl, 2014*)
- **Little research** has examined a self-efficacy promoting intervention on persons with more advanced MS and/or high disability severity



## Objective

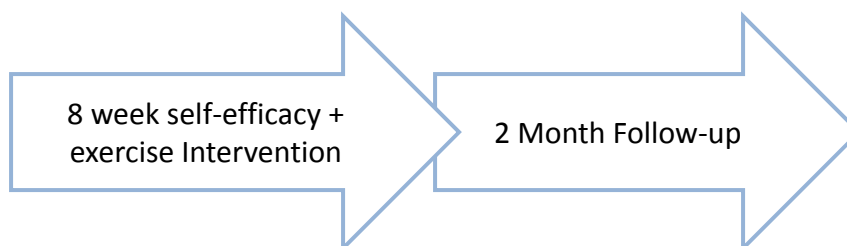
Analyze the effects of a **self-efficacy + exercise intervention** in a middle-aged individual with **advanced MS & low self-reported self-efficacy** on:

- Self-Efficacy
- Physical activity
- Quality of life
- Fatigue

## Functional Baseline/Characteristics

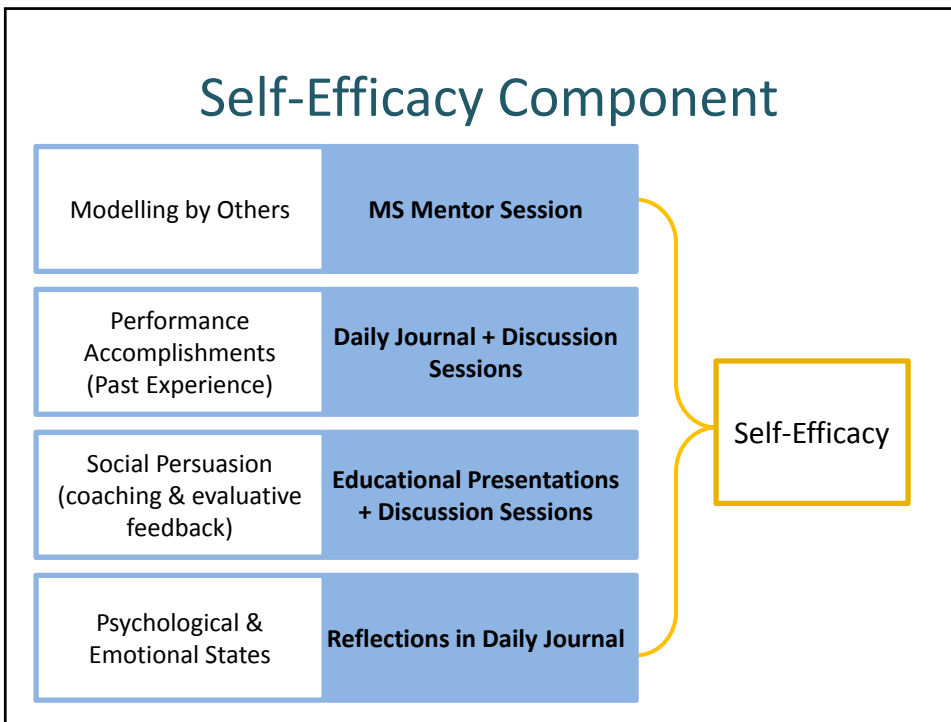
- 60 year old Caucasian female with SPMS
- 21 years since diagnosis of MS
- **EDSS score:** >7
- **Most disabling symptoms:**
  - Cerebellar ataxia
  - Increased muscle tone in upper & lower extremities
  - Bilateral hip flexor & dorsiflexor contractures
- **Usual Exercise Routine:**
  - Daily: Stretches in the morning
  - 3-4 times per week:
    - Walking down hallway (usually cannot make it entire way)
    - Upper extremity exercises w/o weight
    - “Dancing” by pulling up on grab bars (unable to “dance” through entire 3-4 min song)
    - 10-15 mins on personal NuStep

## Study Design



- **Self-efficacy Component**
  - 1x per week education sessions
  - 4 one-on-one mentor sessions
- **Exercise Component**
  - Review of current exercise routine
  - Modifications to maximize adherence

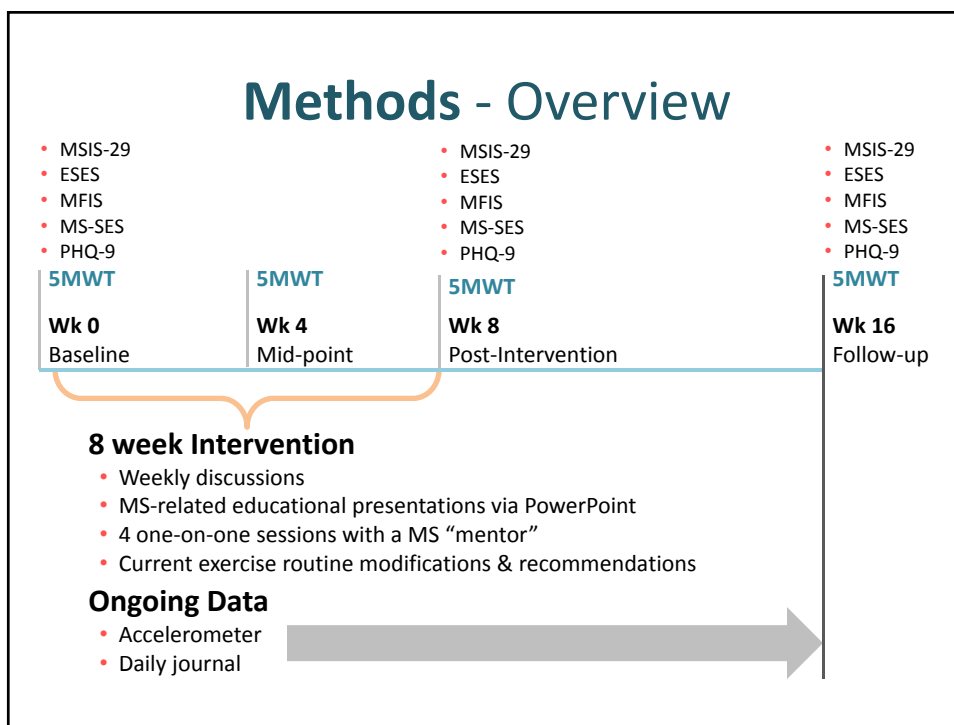
# Self-Efficacy Component

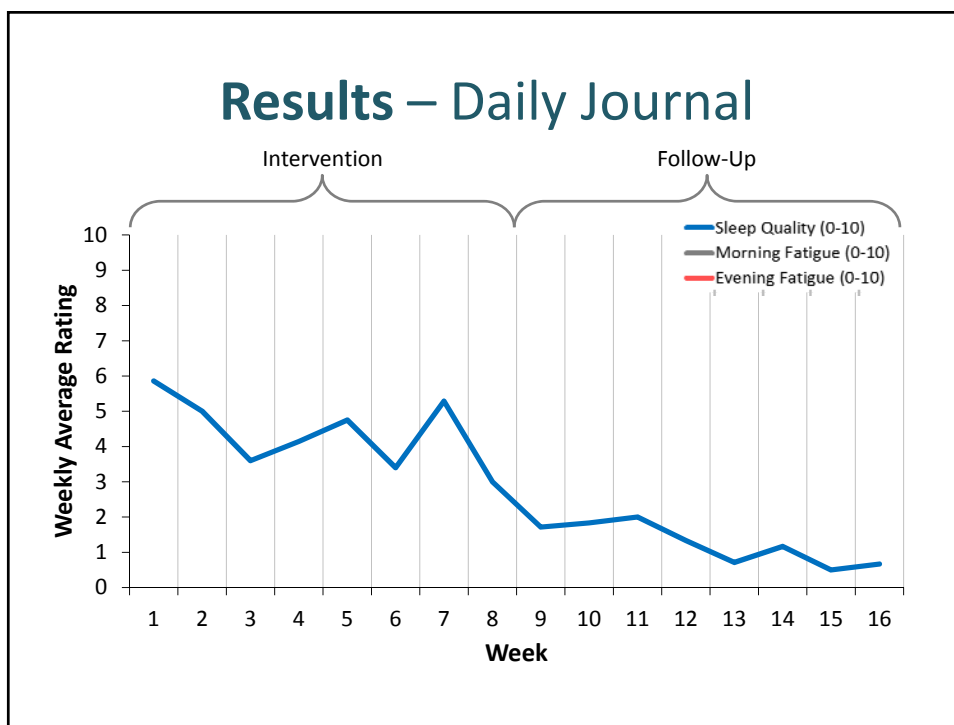
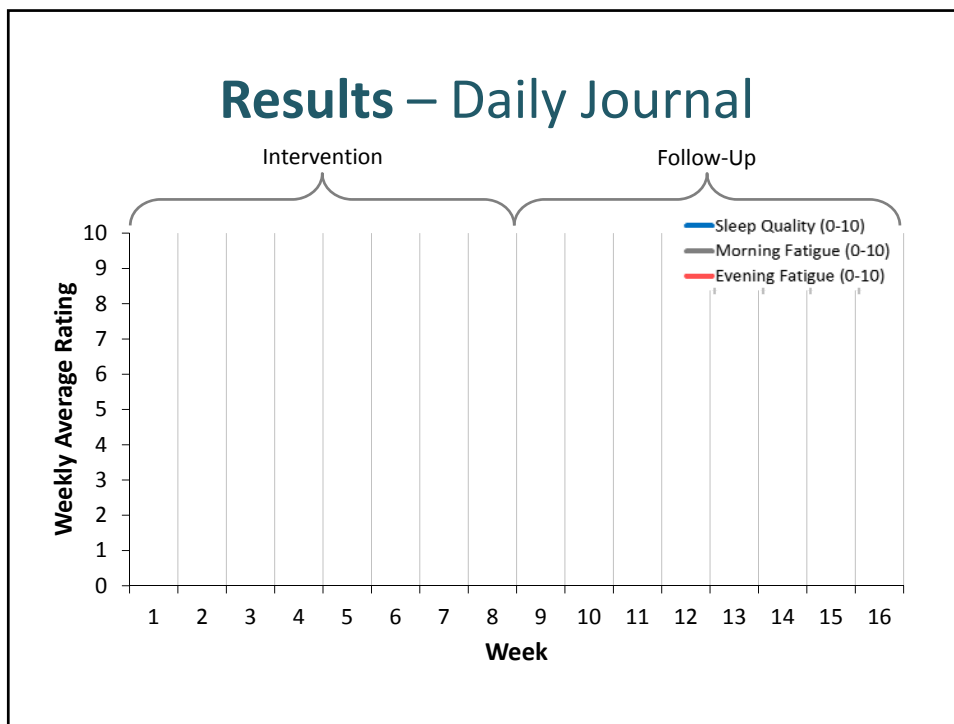


<p><b>Daily Journal</b></p> <ul style="list-style-type: none"> <li>Sleep Quality</li> <li>Morning &amp; Evening Fatigue</li> <li>Day Quality</li> <li>Activity Log</li> <li>General reflection notes</li> </ul>	<p><b>How did you sleep last night?</b> – rate your sleep quality from the night before</p> <table border="1"> <tr> <td>Fantastic</td> <td></td> <td></td> <td>Pretty Good</td> <td></td> <td></td> <td>Just OK</td> <td></td> <td></td> <td>Not Great</td> <td></td> <td>Terrible</td> </tr> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> </tr> </table> <p>Why: _____</p>											Fantastic			Pretty Good			Just OK			Not Great		Terrible	0	1	2	3	4	5	6	7	8	9	10	<p><b>Discussion Sessions</b></p> <p>Presentations about selected by the</p> <p>Notes for spasticity &amp; interventions for MS</p> <p>Change in MS</p>																							
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	<p><b>Fatigue Level</b> – rate your fatigue level for the morning and evening</p> <p><b>MORNING</b> – rate when you first get up in the morning</p> <table border="1"> <tr> <td>Energetic, No Fatigue</td> <td></td> <td></td> <td>Mild Fatigue</td> <td></td> <td></td> <td>Moderate Fatigue</td> <td></td> <td></td> <td>Severe Fatigue</td> <td></td> <td>Worst Possible Fatigue</td> </tr> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> </tr> </table> <p><b>EVENING</b> – rate just before you go to bed</p> <table border="1"> <tr> <td>Energetic, No Fatigue</td> <td></td> <td></td> <td>Mild Fatigue</td> <td></td> <td></td> <td>Moderate Fatigue</td> <td></td> <td></td> <td>Severe Fatigue</td> <td></td> <td>Worst Possible Fatigue</td> </tr> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> </tr> </table>											Energetic, No Fatigue			Mild Fatigue			Moderate Fatigue			Severe Fatigue		Worst Possible Fatigue	0	1	2	3	4	5	6	7	8	9	10		Energetic, No Fatigue			Mild Fatigue			Moderate Fatigue			Severe Fatigue		Worst Possible Fatigue	0	1	2	3	4	5	6	7	8	9	10
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	<p><b>Was today a "Good" or "Bad" day?</b> – circle one at the end of the day</p> <p>It was a <u>GOOD</u> day                      It was a <u>BAD</u> day</p> <p>Why: _____</p>																																																									
	<p><b>Activity Log</b> – list what you did for physical activity today (should include exercises, community outings, etc.)</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Duration, Intensity, Sets, Distance, etc.</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>											Activity	Duration, Intensity, Sets, Distance, etc.																																													
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<p><b>Notes</b> – please use this space to reflect on progress, jot down questions, and any other thoughts. You may use the back of the page if needed.</p>																																																										

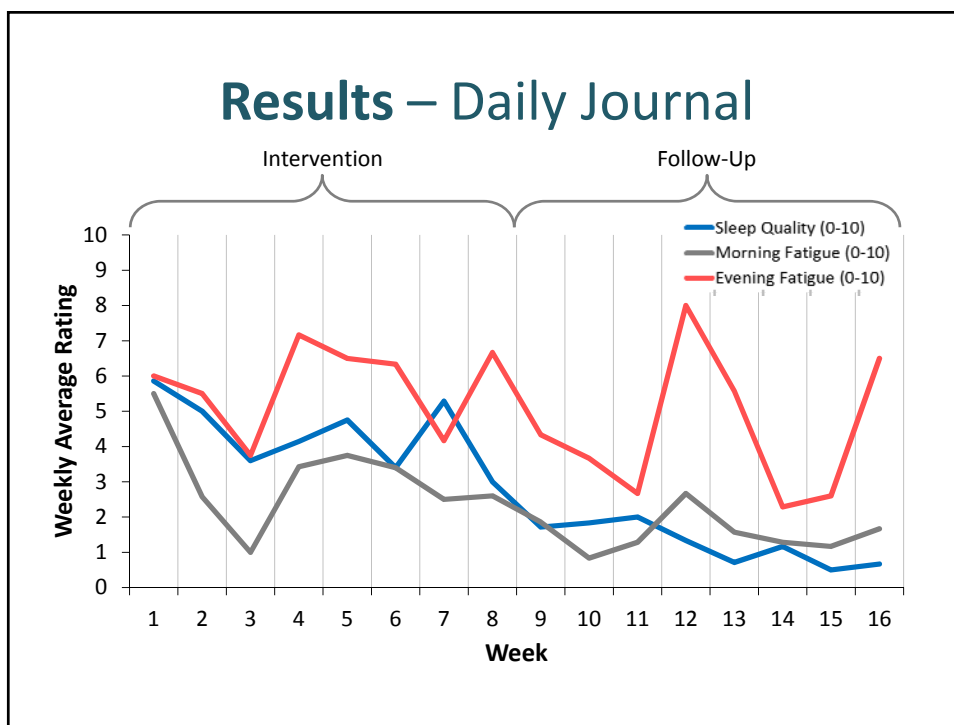
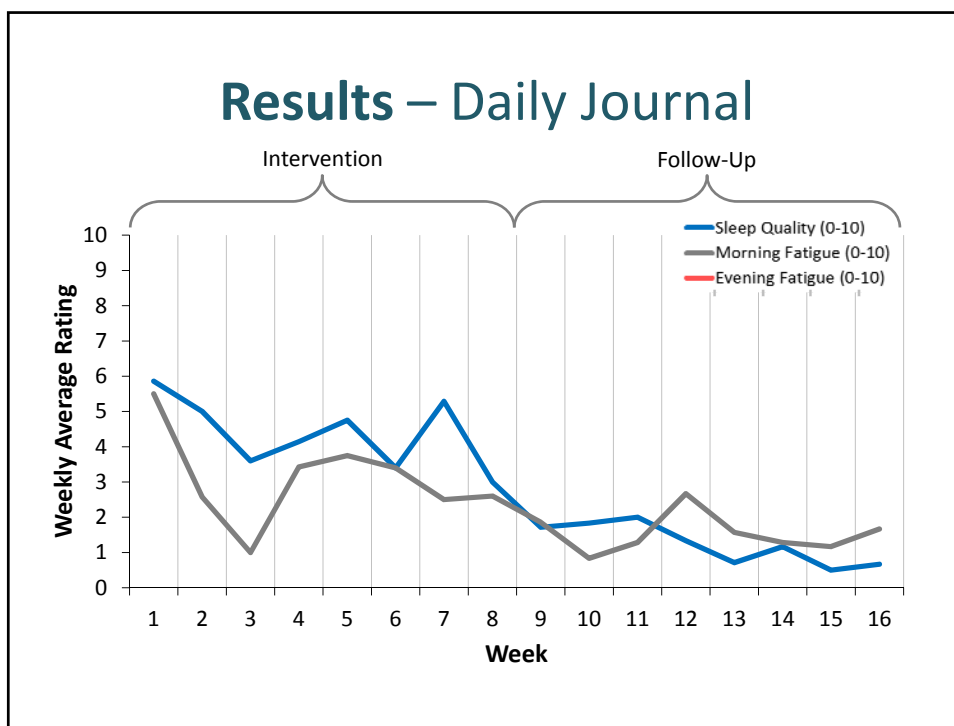
## Outcome Measures

Primary		Secondary	
<b>Exercise Self-Efficacy</b>	Exercise Self-Efficacy Scale (ESES)	<b>Quality of Life</b>	<ul style="list-style-type: none"> <li>MS Impact Scale 29 (MSIS-29)</li> <li>Patient Health Questionnaire 9 (PHQ-9)</li> </ul>
<b>Self-Efficacy to overcome MS-related Barriers</b>	MS Self-Efficacy Scale (MS-SES)	<b>Fatigue</b>	<ul style="list-style-type: none"> <li>Modified Fatigue Impact Scale (MFIS)</li> <li>Daily Journal Fatigue ratings</li> </ul>
		<b>Exercise Tolerance</b>	5 Meter Walk Test (5MWT)
		<b>Physical Activity</b>	<ul style="list-style-type: none"> <li>Daily activity log</li> <li>Accelerometer</li> </ul>









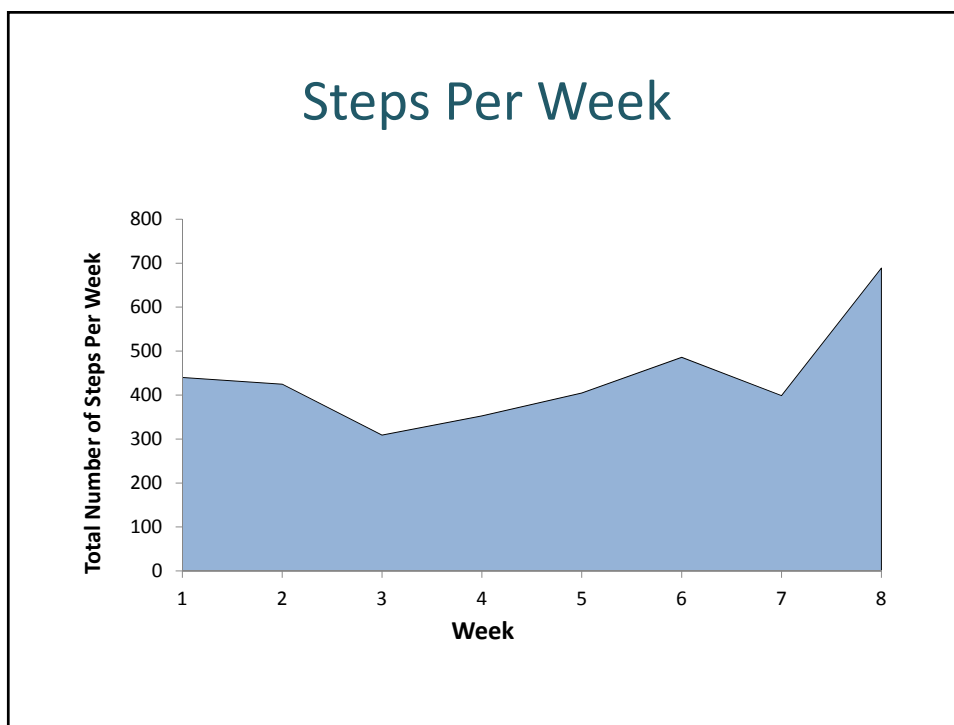
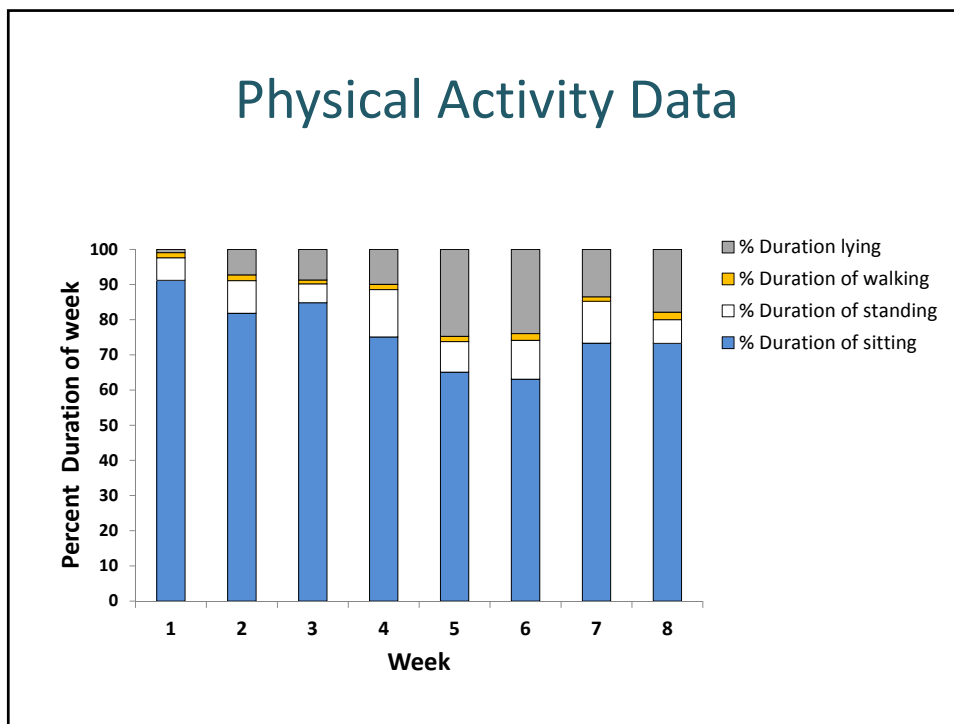
## Results - Questionnaires

Improved self-efficacy to exercise, perceived fatigue + decreased depression

Questionnaire	Week 0	Week 8	Week 16
<b>ESES – Exercise Self-Efficacy</b>	50	90	90
<b>MSIS-29 - QOL</b>	4.17	3.62	3.62
<b>MFIS - Fatigue</b>	48	33	39
<b>MS-SES – Disease Self-Efficacy</b>			
Function	17.78%	21.11%	18.89%
Control	37.78%	34.44%	37.78%
Total	27.78%	27.78%	28.33%
<b>PHQ-9 – Depression (QOL)</b>	15	8	10

## Results – 5MWT

	Week 0	Week 4	Week 8	Week 16
<b>Pre-walk BP (SBP/DBP)</b>	144/70	137/81	137/81	145/83
<b>Post-walk BP (SBP/DBP)</b>	142.5/83	116/72	155/95	140/84
<b>Pre-walk HR (bpm)</b>	73	80	75	70
<b>Post-walk HR (bpm)</b>	73	71	72	72
<b>Gait Speed (inches/sec)</b>	0.098	0.123	0.173	0.180
<b>Total Time (mm:ss.00)</b>	17:10.50	22:22.09	18:58.00	18:16.20
<b>Distance (meters)</b>	2.65	4.19	5	5
<b>Number of seated rest breaks</b>	6	6	10	5
<b>Assistive Device</b>	Rollator	Rollator	Rollator	Rollator



## Interview Findings

- **Most Useful:** Educational & Discussion sessions + MS “mentor” sessions
- **Least Useful:** Daily journal
- **Overall:** enjoyed intervention
- Reports walking better with increased tolerance to exercise
- *Was able to “dance” for an entire 3-4 minute song (has not been able to do that in a long time)*

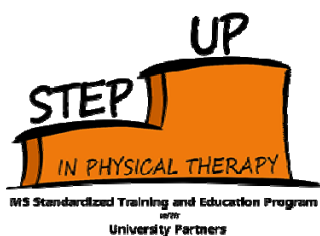
## Some Limitations

- Single-subject study design
- Missing data from daily journal / burden of daily reporting
- Lack of follow up data regarding daily physical activity
- Possible floor effect on some outcome measures
- Proxy reporting

## Conclusion

- **Results suggest that an 8-week self-efficacy intervention may:**
  - Improve self-efficacy to exercise
  - Improve quality of life
  - Reduce perceived fatigue
- Future research should examine a self-efficacy intervention in a larger sample size of persons with progressive MS and severe disability
- Peer mentoring appears to be a very effective method for helping improve self-efficacy

## Acknowledgements



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