A Treatment Outcome Study on the Efficacy of Two Therapy Interventions on the Treatment of Chronic Low-Back Pain in an Elderly Population

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Pain

- Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Generally classified in three main types:
  - Acute
  - Cancer-related
  - Chronic (Ashburn, 2010)

https://www.painmanagementlosangeles.com/a-detailed-information-about-acute-pain-management.html
Chronic Low-Back Pain (CLBP)

• Persistent pain that lasts weeks to years
• Most common cause of job-related disability
• Affects about 100 million adults per year and has an estimated annual cost of $635 billion (Institute of Medicine, 2011)

CLBP and Cognitive Function

• Persistent pain leads to higher rates of anxiety disorders (Taylor, 2001)

• CLBP patients had over 9 times the risk of developing major depression (Atkinson et al., 1991)

• More than 6 million elderly persons per year that experience at least one episode of LBP also report decline in their quality of life and life satisfaction (Weiner, 2006)
Common Treatments of CLBP

- NSAIDs
- Exercise
- Yoga
- Massage
Functional Restoration

• Multidimensional pain management program (Chan, 2016)
• Three particular aspects
  o Myofascial Release Techniques (MFRT)
  o Neural Flossing (NF)
  o Proprioceptive Neuromuscular Facilitation (PNF)
Research Question and Hypothesis

• Purpose: Compare changes in pain and function achieved in a standard fitness program versus an individualized therapy program consisting of multi-dimensional exercises.

• H1: The application of an individualized multidimensional exercise therapy treatment will result in positive changes in physical function, walking pattern and brain processing as measured by subjective questionnaires.

• H0: The application of an individualized multidimensional exercise therapy treatment will not result in positive changes in physical function, walking pattern and brain processing as measured by subjective questionnaires.
Methods

1. Allocation of participants through Center of Healthy Living and Longevity (CHLL)
2. Distribution of participants into Multidimensional Exercise Therapy (MET) or Traditional Senior Exercise Therapy (TET) groups
3. Collection of pre-test measurements
4. Execution of therapeutic interventions
5. Collection of post-test measurements
6. Administration of 6 month post-test assessment
Participants

- Center of Healthy Living and Longevity (CHLL)
- Reported CLBP
- Aged 65 or older
Traditional Senior Exercise Therapy (TET)

• Performed 3 times a per week for 45 minutes per session
• Guided by an instructor
• Focus on practicing activities of daily living (ADL) and improving strength and increasing muscle
  – Chair stands
  – Walking
  – Chair supported squats
Multi-dimensional Exercise Therapy (MET)

• Participants receive an individualized treatment program addressing specific functional disabilities
• Movements designed to improve range of motion, flexibility and strength of hip and low-back
• Common intervention will include
  – MFRT
  – NF
  – PNF
• Therapy occurs twice a week on campus and once a week in home
PROMIS-29

• Measures psychosocial outcomes
• Focus on the previous seven days
• Scored on a 5-point likert scale
• Questions focused on ADLs
NeuroCom SOT

• Identifies abnormalities in the patients use of the three balance systems
  – Somatosensory
  – Visual
  – Vestibular
Senior Fitness Test

• A series of tests that assess the major components of fitness for older adults
  – Body strength
  – Agility
  – Aerobic endurance
  – Flexibility
I-Gait Assessment

- Record tridimensional full body motion during walking gait for subjects
- No sensors or special clothing required
## Results

Table 1: PROMIS measures after MET and TET treatments were administered

<table>
<thead>
<tr>
<th>Treatment</th>
<th>PROMIS Measures</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
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<tbody>
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<td>Trowbridge's Treatment</td>
<td>postAnxiety/Fear</td>
<td>8</td>
<td>40</td>
<td>63</td>
<td>50.75</td>
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<td></td>
<td>postPhysical Function</td>
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<td>39</td>
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<td>postSleep Disturbance</td>
<td>8</td>
<td>32</td>
<td>73</td>
<td>49</td>
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<tr>
<td></td>
<td>Valid N (listwise)</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>Group Therapy</td>
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Table 2: NeuroCom measures after both MET and TET treatments were administered.

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<th>Treatment</th>
<th>NeuroCom Measures</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
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Results cont.

- MET results in positive changes in brain processes and physical functioning
- Walking patterns were not affected

Table 3: iGait measures after MET and TET treatments were administered
Discussion

- Prior research examining TET and MET interventions is scarce
- Study provided the first comprehensive biopsychosocial results in scientific literature
- Massage has been shown to produce positive treatment outcomes (Cherkin et al, 2010)
- Massage treatment in conjunction with exercise improved physical condition (Furlan et al, 2014)
Conclusion

• 8 out of 10 individuals experience some form of LBP at some point in their lives (Weiner, 2010)
• Treatments of CLBP can be expensive or addictive
• Exercise in addition to an FR program has proven to be an effective treatment option for CLBP in an elderly population