A motorized elliptical was developed to address barriers to physical activity that individuals with motor control, strength, and endurance limitations face. This trainer was adapted with a body weight support (BWS) system, ramp, steps, safety rails, footplate straps, and an adjustable seat to enhance access. A sensor controlled motor was integrated to initiate and sustain pedal motion for continuous training up to 65+ revolutions per minute (rpm).

**Purpose**

Assess use of motorized elliptical trainer in a community-based medical fitness facility for individuals with physical limitations or chronic medical conditions.

**Methods**

**Participants**

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Age (y)</th>
<th>Height (m)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebral Palsy</td>
<td>43</td>
<td>1.58</td>
<td>75.0</td>
</tr>
<tr>
<td>Stroke</td>
<td>74</td>
<td>1.50</td>
<td>72.7</td>
</tr>
<tr>
<td>Peripheral Arterial Disease</td>
<td>75</td>
<td>1.75</td>
<td>119.6</td>
</tr>
<tr>
<td>Stroke</td>
<td>59</td>
<td>1.65</td>
<td>78.6</td>
</tr>
<tr>
<td>Cardiovascular Disease</td>
<td>80</td>
<td>1.78</td>
<td>96.4</td>
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<tr>
<td>Rheumatoid Arthritis</td>
<td>42</td>
<td>1.63</td>
<td>52.3</td>
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<tr>
<td>Stroke</td>
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<td>1.73</td>
<td>70.5</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>73</td>
<td>1.63</td>
<td>92.3</td>
</tr>
<tr>
<td>Spinal Cord Injury</td>
<td>52</td>
<td>1.65</td>
<td>86.4</td>
</tr>
<tr>
<td>Multiple Sclerosis</td>
<td>47</td>
<td>1.63</td>
<td>63.6</td>
</tr>
</tbody>
</table>

**Instrumentation**

- Motorized SportsArt E870 Elliptical Trainer

**Procedures**

- Participants trained for 12 sessions.
- Velocity (VEL), stride length (SL), and BWS increases determined by participant performance, with session duration (DUR) determined by perceived exertion (RPE), heart rate (HR) and blood pressure (BP).

**Results**

- **Motorized Elliptical Variables**
  - Motorized Elliptical Velocity (RPM): 34 and 39
  - Duration (min): 15 and 18
  - Stride Length (inches): 20 and 22

- **Physiological Variables**
  - Rate of Perceived Exertion: 13 and 12
  - Heart Rate (Beats/min): 100 and 106
  - Systolic Pressure (mmHg): 133 and 133
  - Diastolic Pressure (mmHg): 765 and 96

- **Functional Variables**
  - Comf Walking Velocity (m/min): 44 and 48
  - Fast Walking Velocity (m/min): 710 and 798
  - 5 Minute Walk Test (meters): 540 and 765
  - Timed Up and Go (seconds): 25 and 25

- **Comparison of measurements Pre vs. Post**
  - Significant Difference p < 0.05 (⋆)

**Discussion**

The motorized elliptical is a promising fitness modality for individuals in the community with activity limitations, as evidenced by increases in exercise tolerance and corresponding improvements in fast walking speed and endurance training.

**References**


**Acknowledgements**

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