Does Physical Activity Decrease Cognitive Decline Among Older Adults with Dementia?

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Duke University Doctor of Physical Therapy Program and Duke University Medical Center Library

**Background**
- Most common type of dementia is Alzheimer’s Disease (AD).
- AD affects 1 in 9 people aged 65 and older.
- AD is the 5th leading cause of death in people aged 65 and older in the US.
- Physical activity (PA) has been suggested as a treatment approach to decrease cognitive decline in dementia/AD.
- We defined physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure (as defined by the World Health Organization).

**Methods**
- We searched PubMed, Scopus, CINHAL, Cochrane Database, and PsycINFO from inception of each database to May 2015.
- Inclusion Criteria:
  - Participants with cognitive decline (i.e. AD, dementia, mild cognitive impairment)
  - Objectively measured PA as intervention
  - Measured cognitive status as an outcome
  - Comparators: any active or inactive control
- Exclusion Criteria:
  - Specific to early onset dementia
  - Not published in English
- We did a duplicate process of screening, eligibility, inclusion, and quality assessment.

**Flow of Study Selection**
- Records identified through database searching (n = 425)
- Records after duplicates/removed (n = 383)
- Records screened (n = 383)
- Records excluded (n = 335)
- Full-text articles assessed for eligibility (n = 48)
  - Incorrect study design
  - Exercise not a primary intervention
  - Non AD/Dementia population
  - Did not assess desired outcome
- Studies included in quantitative syntheses (meta-analysis) (n = 7)

**Purpose**
To review systematic reviews of the literature to determine if PA decreases cognitive decline in dementia/AD.

**Results**

**Table 1: Study Characteristics**

<table>
<thead>
<tr>
<th>Study Type</th>
<th>Population</th>
<th>Intervention</th>
<th>Comparator</th>
<th>Duration</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heyn et al., 2004</td>
<td>23 weeks</td>
<td>RCT</td>
<td>Control</td>
<td>12 weeks</td>
<td>NR</td>
</tr>
<tr>
<td>Zhu et al., 2015</td>
<td>13 weeks</td>
<td>RCT</td>
<td>Control</td>
<td>14 weeks</td>
<td>NR</td>
</tr>
<tr>
<td>Eggermont et al., 2006</td>
<td>6-36 weeks</td>
<td>Mixed Studies</td>
<td>Control</td>
<td>8 weeks</td>
<td>NR</td>
</tr>
</tbody>
</table>

**Table 2: Participant Characteristics**

<table>
<thead>
<tr>
<th>Measures</th>
<th>Mean ± SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>83.2 ± 9.4</td>
<td>76-98</td>
</tr>
<tr>
<td>Baseline MMSE</td>
<td>22.83 ± 11.1</td>
<td>0-30</td>
</tr>
<tr>
<td>Duration</td>
<td>20 weeks</td>
<td>12-36 weeks</td>
</tr>
<tr>
<td>Intensity</td>
<td>1.8 ± 0.6</td>
<td>1-3</td>
</tr>
<tr>
<td>Mean Steps</td>
<td>8743 ± 3287</td>
<td>181-18,397</td>
</tr>
</tbody>
</table>

**Table 3: Physical Activity Characteristics**

<table>
<thead>
<tr>
<th>Measures</th>
<th>Mean ± SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
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<tr>
<td>Mean Steps</td>
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</tr>
</tbody>
</table>

**Effects Sizes from Meta-Analysis with the outcome of Mini-Mental Status Exam**

<table>
<thead>
<tr>
<th>Design</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCT Only</td>
<td>1.84</td>
</tr>
<tr>
<td>Mixed Studies</td>
<td>1.94</td>
</tr>
</tbody>
</table>

**Conclusions**
- As little as 2/week of PA has been associated with decreased cognitive decline among dementia/AD patients.
- Physical therapists should consider PA activities with older adults with dementia/AD.
- PA may positively impact functional performance and ability to perform ADLs.

**References**