Background

Decreased physical activity (PA) can lead to increased comorbidities, loss of function, and decreased overall quality of life in persons with multiple sclerosis (PwMS). PA has been shown to be lower in PwMS compared to healthy controls, and inversely related to disability. While there have been guidelines presented on exercise and lifestyle PA for PwMS by disability level, there is no current literature that demonstrates how PA differs across different domains of life such as work, active transportation, domestic and garden, and leisure domains by disability level. This information would be beneficial to help clinicians determine what domains can be focused on to increase PA in PwMS.

Objectives

1) To compare PA levels of the work, active transportation, domestic and garden, and leisure domains between disability levels in PwMS.

Methods

Participants

- A total of 183 PwMS were included in this secondary analysis of a larger study.

Study Design

- One-time research visit in which the following variables were captured:

Demographics and characteristics

- Age, gender, race, ethnicity, disease duration, self-reported disability
- Work (MET/min/week)
- Active Transportation (MET/min/week)
- Domestics and Garden (MET/min/week)
- Leisure-time (MET/min/week)

PA: International Physical Activity Questionnaire–Long Form (IPAQ-LF)

- Total PA (MET/min/week)
- Total Sitting (min/week)

Results

Table 1. Descriptive Statistics of Physical Activity Domains and overall, between-group differences

<table>
<thead>
<tr>
<th>PA Measure (MET/min/week)</th>
<th>Mild (0-1)</th>
<th>Moderate (2-3)</th>
<th>Severe Ambulant (4-6)</th>
<th>Severe Non-Ambulant (7-8)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>154.3 (1426.5)</td>
<td>0.0 (1239.8)</td>
<td>0.0 (24.8)</td>
<td>0.0 (0.0)</td>
<td>0.001</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>16.5 (383.6)</td>
<td>0.0 (235.1)</td>
<td>0.0 (280.5)</td>
<td>0.0 (0.0)</td>
<td>0.142</td>
</tr>
<tr>
<td>Domestic and Garden</td>
<td>0.0 (120.0)</td>
<td>0.0 (65.0)</td>
<td>0.0 (0.0)</td>
<td>0.0 (180.0)</td>
<td>0.024</td>
</tr>
<tr>
<td>Leisure-Time</td>
<td>566.0 (1327.5)</td>
<td>346.5 (1039.5)</td>
<td>258.8 (1243.9)</td>
<td>640.0 (2310.0)</td>
<td>0.303</td>
</tr>
<tr>
<td>Total PA Score</td>
<td>3506.3 (12272)</td>
<td>2558.8 (8341.6)</td>
<td>1474.5 (3414.0)</td>
<td>1680.0 (2430.0)</td>
<td>0.001</td>
</tr>
<tr>
<td>Total Sitting (min/week)</td>
<td>2250.0 (1657.5)</td>
<td>2295.0 (1350.0)</td>
<td>3360.0 (2460.0)</td>
<td>3720.0 (2205.0)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Demographic and Characteristic Descriptive Statistics:

- Participants had a median age of 53.0 (21.0-75.0) years old and a disease duration of 12.8 (0.3-44.4) years.
- Of the participants, 77.0% were female, 92.3% were not Hispanic or Latino, 86.9% was White, 12.0% were Black, and 1.0% was “other” race.

Demographic and Characteristic Comparisons:

- No difference was found between disability subgroups for gender, race, or ethnicity (P > 0.05).
- An overall difference found for age (H(3) = 22.109, P < 0.001) and disease duration (H(3) = 14.910, P = 0.002).

Table 2. Comparisons between disability subgroups for significant Physical Activity Domains

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Work</td>
<td>0.001</td>
<td>0.105</td>
<td>0.078</td>
<td>0.296</td>
</tr>
<tr>
<td>Active Transportation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic and Garden</td>
<td>0.019</td>
<td>1.000</td>
<td>0.113</td>
<td>1.000</td>
</tr>
<tr>
<td>Leisure-Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total PA Score</td>
<td>&lt;0.001</td>
<td>1.000</td>
<td>0.040</td>
<td>1.000</td>
</tr>
<tr>
<td>Total Sitting (min/week)</td>
<td>&lt;0.001</td>
<td>0.001</td>
<td>&lt;0.001</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Discussion

- In each of the disability sub-groups, PA was highest during Leisure-time.
- PA differs the most between mild and severe ambulant disability levels.
- PwMS have a significantly lower level of Total, Work, and Domestic and Garden PA as disability increases.
- Suggesting that PwMS with higher disability may not be working any longer or tend to work in non-physically demanding jobs.
- As disability increases, completing physically demanding domestic chores and gardening decreases, and ultimately PwMS with greater disability may need more help in carrying out those activities of daily living.
- Total sitting time was the only PA measure that was different among the other group comparisons.
- Compared to current recommendations of PA for PwMS, the participants in this study had a median Total PA MET/min/week higher than the recommended PA (450 MET/min/week) for all disability sub-groups.
- For each subgroup, at least half of them are achieving the recommended amount of PA, even those in the highest disability sub-groups.
- 450 MET/min/week is based on the current recommendation to complete 150 minutes per week of physical activity (7,500 steps per day) at a light-intensity MET level such as walking (3.0 MET/min).
- One limitation of this analysis is that the severe non-ambulant group only had five PwMS, which means we may not be able to generalize our findings of the severe non-ambulant group.

Conclusion

The findings of this analysis suggest total sitting time may be the largest difference of PA between all disability levels. Additionally, as disability increases, Total PA and PA during Work and Domestic and Garden activities decrease, while Sitting Time increases. As disability increases, these findings can help clinicians understand which aspects of PA in PwMS are affected the most and can be utilized to help them make recommendations to PwMS to increase PA in those specific domains.

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References