Introduction

Sedentary behaviour (SB) is any seated or reclined posture that elicits < 1.50 Metabolic Equivalent Tasks (METs).

SB independently affects health status \( ^1 \) and is more prevalent in older adults (9.3±0.1 hrs 24 hrs\(^{-1} \)) than in youth (6.1±0.1 hrs 24 hrs\(^{-1} \)) \(^1\). However, the patterns of SB and physical activity (PA) accumulation have not been described.

The present study aimed to examine the patterns of SB and PA accumulation in a population of free-living older adults, classifying groups by mobility level.

Method

A triaxial GENEActiv accelerometer (GENEA, Activinsights, Kimbolton, UK) was thigh-mounted anteriorly at 50% of femur length using 2 Tegaderm patches (3M HealthCare, St. Paul, USA).

Participants (n=90; age: 73.7±6.3 years, 48 females) completed 7 continuous days of habitual mobility before returning the GENEActiv.

The Cheshire Algorithm of Sedentarism (CAS) \( ^2 \) was used to analyse 10 s epoch data. CAS first compared the axes’ G values to determine posture (Figure 1). CAS then estimated the intensity of the mobility through an algorithm that matched Residual G \( ^3 \) (GENEA output) to known older adult MET values for a given task.

The GENEActiv cut-point between SB and Light intensity PA (LIPA) (1.50 METs) was 0.057 G while the GENEActiv cut-point between LIPA and Moderate to Vigorous PA intensity (MVPA) (3.00 METs) was 0.216 G.

The GENEActiv recorded the amount of time spent performing the basic mobility (Table 1) and then classified participants into a mobility group based on these basic mobility levels (Table 2). Advanced GENEActiv mobility outcomes are in Table 3.

Results - presented as mean ± standard deviation, p ≤ 0.05

Kruskall-Wallis (Mann-Whitney U post hoc) revealed that older adults of different mobility classifications accumulate SB and PA in unique ways to one-another (Figure 2).

Although group differences for SB time were found (Figure 2), no group differences were present for SB Breaks (Figure 3).

Ambulators accumulated 50% of their daily SB time using shorter SB bouts compared to Sedentary and ACP groups (Table 4). This was due to Ambulators accumulating more Standing, LIPA, and sMVPA than ACP and Sedentary populations (Figure 2).

Interestingly, Sedentary and ACP had similar W50% results (Table 4).

ACP performed more cMVPA bouts per 24 hrs (Table 4), which resulted in a higher amount of cMVPA (Figure 2) than Sedentary and Ambulator groups.

Table 4 Group differences in W50% and cMVPA Bouts for an average 24 hrs day had

<table>
<thead>
<tr>
<th>Mobility</th>
<th>Sedentary</th>
<th>Ambulator</th>
<th>ACP</th>
</tr>
</thead>
<tbody>
<tr>
<td>W50% (mins)</td>
<td>58.5±22.9</td>
<td>39.2±13.3*</td>
<td>49.2±20.5</td>
</tr>
<tr>
<td>cMVPA Bouts (n)</td>
<td>0.39±0.80*</td>
<td>0.41±0.78*</td>
<td>2.04±1.98</td>
</tr>
</tbody>
</table>

† Significantly different from Ambulator. * Significantly different from ACP, p ≤ 0.05.

Discussion & Conclusion

Our findings suggest that free-living older adults use different patterns of SB/PA. Thus, 1%, 12%, 14% and 72% of the study population could be categorised as Active Ambulator, Ambulator, ACP, and Sedentary, respectively. Those who have shorter SB bouts and accumulate the least amount of SB appear to substitute this time with Standing, LIPA and sMVPA as opposed to cMVPA.

Using both W50% and SB break as a collective measure of SB patterns may be sufficient to highlight differences between older adults. Future research should aim to examine how these multiple SB/PA patterns affect health status.

References