A Scoping Review: Associations Between Assistive Device (AD) Use and Fall Risk in People with Parkinson’s (PwP)

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Background and Purpose

Prospective studies have shown that over 50% of people with Parkinson’s (PwP) fall at least once per year, with over half of these individuals falling more than once1. Research has shown assistive devices (AD) to be beneficial for preventing falls in the older population2. Anecdotally, PwP often express hesitancy to use AD’s because of a common misperception that AD use may increase, rather than decrease, fall risk.

Objective

To investigate the availability of literature describing the association between AD use and falls in PwP.

Methods

- A scoping review was performed in accordance with the Arksey and O’Malley framework.
- 3 independent PubMed searches were performed
- The studies were then organized in REDCap and analyzed by one researcher
- The studies were summarized by participants/population, concept, and context
- 3 criteria used to determine study eligibility (Table 1)

Table 1. Inclusion Criteria

<table>
<thead>
<tr>
<th>Concept</th>
<th>Context</th>
<th>Study</th>
<th>Participants/Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falls are included as an outcome</td>
<td></td>
<td></td>
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<tr>
<td>The population must include Parkinson’s (PwP)</td>
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<td>The study involves a physical assistive device, rather than a device which solely provides cueing or other assistive cues, serves to immobilize a joint, such as an AFO, or other (neuro) prosthetic</td>
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<tr>
<td>Studies that met all 3 inclusion criteria were read and analyzed by each researcher</td>
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</tbody>
</table>

Results

Of 876 articles screened, 3 articles met the inclusion criteria

Articles that Met Inclusion Criteria

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<th>Participants/Population</th>
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<tbody>
<tr>
<td>Kegelmeyer et al, Gait Posture, 20122</td>
<td>PwP</td>
<td>Randomized Controlled Trial</td>
<td>FWW can provide safe and smooth gait for PwP</td>
<td></td>
</tr>
<tr>
<td>Booninsukth et al, Physical Therap, 20122</td>
<td>14 PD patients and 11 Without PD</td>
<td>Randomized Controlled Trial</td>
<td>PwP have poorer postural stability without AD use</td>
<td></td>
</tr>
<tr>
<td>Manis et al, BMC Geriatrics, 20206</td>
<td>Home-care geriatric patients, including PwP</td>
<td>Population based, Cross Sectional study</td>
<td>Found associations between personal factors and falls in home health patients</td>
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</table>

Qualitative Synthesis

1. No evidence that shows AD use increases falls in PwP
2. The 3 relevant studies provided conflicting results about assistive devices and falls in PwP
3. A common theme found in previous studies was lack of formal education for patients using an AD 6
4. Prior studies associate AD use and falls in elderly people, but the association is not necessarily causal 6, 7, 8
5. Certain studies have perpetuated the notion that using an AD could cause falls 6, 7, 8
6. There is a gap in the existing research relating to the association between assistive devices and falls in PwP

References

2. Cruz-AO et. al, Disabil Rehabil Assist Technol, 2020
5. Manis et. al, BMC Geriatrics, 2020
6. Mann et. al, Physical & Occupational Therapy In Geriatrics, 1995
Prospective studies have shown that over 50% of people with Parkinson’s (PwP) fall at least once per year, with over half of these individuals falling more than once\(^1\). Research has shown assistive devices (AD) to be beneficial for preventing falls in the older population\(^2\). Anecdotally, PwP often express hesitancy to use AD’s because of a common misperception that AD use may increase, rather than decrease, fall risk.
Objective

To investigate the availability of literature describing relationships between AD use and falls in PwP.
Methods

● A scoping review was performed in accordance with the Arksey and O’Malley framework.
● 3 independent PubMed searches were performed
● The studies were then organized in REDCap and analyzed by one researcher
● The studies were summarized by participants/population, concept, and context
● The team utilized 3 criteria to determine study eligibility

Table 1. Inclusion Criteria

| ➢ The population must include Parkinson’s (PwP) |
| ➢ Falls are included as an outcome |
| ➢ The study involves a physical assistive device, rather than a device which solely provides cueing or other assistive cues, serves to immobilize a joint, such as an AFO, or other (neuro) prosthetic |

● If the studies answered yes to all three of the inclusion criteria, they were then read and analyzed by each researcher
Most studies did not include either falls or AD's.
### Articles that Met Inclusion Criteria

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| Kegelmeyer et. al, Gait Posture, 2012[^3] | PwP                      | The study examined the impact of a broad range of assistive devices on gait measures during walking in both a straight path and around obstacles | Randomized Controlled Trial    | • FWW can provide safe and smooth gait for PwP  
• Standard walkers, two-wheeled walkers, U-step walker, and 4WW may be safer than canes or no AD for PwP |
| Boonsinsukh et. al, Physical Therap, 2012[^4] | 14 PD patients and 11 Without PD | Evaluate effects of cane use on postural recovery from a slip             | Randomized Controlled Trial    | • PwP have poorer postural stability  
• PwP benefit from cane use |
| Manis et. al, BMC Geriatrics, 2020[^5] | Home-care geriatric clients, including PwP | Analysis of RF in homecare that contribute to falls                       | Population based, Cross Sectional study | • Found associations between personal factors and falls in home health patients  
• PwP were more likely to fall when using a cane compared to without |
1. No evidence that shows AD use increases falls in PwP
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6. There is a gap in the existing research relating to the association between assistive devices and falls in PwP
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- Studies that met all 3 inclusion criteria were read and analyzed by each researcher

Results
Of 876 articles screened, 3 articles met the inclusion criteria

Initial:876

Records identified through database searching: 876
Records identified through other sources: 1
Records after duplicates removed: 876
Records after ICCC screening: 876
Records screened: 876
Records excluded: 876

Full-Text Articles assessed for eligibility: 3
Full-Text Articles included, with reasons: 0
Studies included in Qualitative synthesis: 3

Final:3

No evidence that shows AD use increases falls in PwP
The 3 relevant studies provided conflicting results about assistive devices and falls in PwP
A common theme found in previous studies was lack of formal education for patients using an AD
Prior studies associate AD use and falls in elderly people, but the association is not necessarily causal
Certain studies have perpetuated the notion that using an AD could cause falls
There is a gap in the existing research relating to the association between assistive devices and falls in PwP

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