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## "My Wife and I Invariably Go Together": A Mixed Methods Analysis of Physical Activity and its Influences on Older Adult Dyads

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### Abstract

**Background:** Physical activity (PA) is an imperative factor to healthy cognitive and functional ageing and may act as a protective factor against cognitive decline. Evidence suggests that as we age, PA declines, leaving a large proportion of older adults (OAs) 'underactive' and 'unprotected'. Socialisation/social support is considered a beneficial influence on PA in OAs. It is unclear whether dyadic (e.g. spousal) influences impact PA in healthy ageing, and how this might impact digital activity monitoring or intervention development to support prevention of cognitive decline. This research aims to quantify volume and types of PA and explore influential factors for PA participation in OAs.

**Method:** Participants were recruited via the ActivDyad study, where they wore a lumbar-based-accelerometer (AX6, Axivity) for 7 days, and completed a 7-day activity diary. PA (i.e. daily steps) was derived from accelerometers using validated algorithms. Qualitative content analysis of the diaries was adopted for contextual understanding of the types and influences of PA. The Theoretical Domains Framework was utilised to identify common facilitators/barriers of PA in OAs.

**Result:** 21 dyads (42 OAs) participated in the study; 10 dyads were included in preliminary analysis (mean age (mean±SD): 68.6±4.8; 100% heterosexual & married; mean relationship time: 45±10 years; 80% retired). Participants carried out an average of 15,680 daily steps (range: 7,243-22,668), and indicated their most frequent PA as: shopping, gardening, housekeeping, and recreational walks (Table 1). Participants identified potential facilitators (Table 2) and barriers (Table 3) for partaking in PA. Social influence (e.g. partner) was identified as most influential; 75% of participants mentioned this as a facilitator for PA. Environmental context, particularly weather conditions, were frequently discussed as both a facilitator (50%) and barrier (45%) to PA.

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**Conclusion:** Results suggest that dyadic interactions are a key facilitator of PA in OAs. Weather appears to have a bi-conditional influence, promoting and/or discouraging PA; this may impact activity monitoring during adverse weather conditions (e.g. lower steps). Adherence may be higher in group PA interventions, and outdoor PA should be promoted in suitable weather. Analysis of the full sample will inform studies focusing activity monitoring and intervention development for dementia-carer dyads.

Table 1: Content analysis of most common activities mentioned in 7-day activity diary.

|                       | ~ ~ ~                           |  |
|-----------------------|---------------------------------|--|
| Activity              | % of<br>Participant<br>Mentions | Examples of related quotes   |
| Recreational<br>Walks | 90%                             | "We went for a walk around 17:15 this afternoon. Walk was very relaxing,<br>walking between fields of rapeseed flowers. We walked around 2 hours<br>with break of 25 minutes."<br>"This afternoon, as we often do, as long as the weather isn't too bad, my<br>husband and I went for a walk."   |
| Shopping              | 90%                             | "I walked to the local shops and then back home again. I didn't need<br>anything at the shops but it was a nice day and I like to have a walk before<br>my evening meal whenever I can."<br>"Also went to [city] to buy some fresh coriander and meat and walked to a<br>new shop with lovely sweets. It was very satisfying."   |
| Housekeeping          | 85%                             | "Returned home and again continued with washing and ironing. This had<br>been a big task because of the weather and taking things on and off an<br>outside washing line. Dealing with large bedding items, duvets, pillows,<br>mattress covers, general washing has been strenuous, but we are almost<br>through it."  |
| Gardening             | 70%                             | "Gardening again and preparing the back yard for (). Quite a lot of<br>physical work as we were moving bricks and wooden planks to another<br>part of the back yard. In total we did 20-30 minutes then 45-50 minutes."<br>"My main physical activity today has been the gardening I did in the<br>evening from 6:30pm until 8pm. This was prompted by me having bought<br>bedding plants while we were out plus the fact that my husband had cut the<br>grass and the garden was looking good."<br>"Mowed the grass at the back of the house using a heavy electric mower<br>which one has to push. As ours is a terraced garden, this had the additional<br>'benefit' (I don't always see it as such) of me having to carry the mower up<br>and down steep steps from the garage." |

Note: % of participant mentions refers to the number of participants mentioning activity divided by total diaries.

| Table 1: Example          | s of the Most Co        | mmon 1 hemati                      | c kesponses of Facultating Physical Activity.   |
|---------------------------|-------------------------|------------------------------------|---|
| <b>TDF Domains</b>        | % of                    | Subtheme                           | Examples of related quotes  |
|                           | Participant<br>Mentions |                                    |   |
| Social Influence          | 75%                     | Partner                            | "Unless one of us is unwell or has another appointment, my<br>wife and I invariably go together, as this is enjoyable and<br>motivating for us both. As she is also the primary carer for a<br>family member, we also use this time for discussion, relaxation<br>and as an opportunity to 'de-stress'."<br>"Although I do enjoy walking alone. I prefer walking with<br>someone and on this occasion with (partner). It provided the<br>onnortunity for relaxed conversation." |
|                           | 60%                     | Family                             | "We look after our 2 year old granddaughter on a Friday, 8am to 5pm. She is a total livewire so it is none stop throughout the day. We normally start with her breakfast and try and make her day as interesting as we can. This normally includes playing, walking, visiting the shops, library and getting her to interact with jobs around the house and garden."  |
|                           | 60%                     | Friends                            | "In the morning I met a friend (ex-colleague) and walked in a<br>local county park for about an hour. I meet this friend once or<br>twice a month. We walk quite slowly-not physically taxing."   |
| Environmental<br>Context  | 50%                     | Weather                            | "We do enjoy this walk! We enjoy it more when the sun shines<br>which it did today resulting in a beautiful day for us!"<br>"7:15 dog walk, slightly further than usual because it was so<br>lovely out."   |
| Behavioural<br>Regulation | 45%                     | Monitoring<br>Physical<br>Activity | "At the end of the day I was pleased that we had made the<br>effort to walk in the evening. My personal Fitbit recorded<br>10000+ by bedtime."<br>"For the 8 <sup>th</sup> consecutive day I have closed all three rings on<br>my Fitness App."   |
| Emotion                   | 45%                     | Stress relief                      | "I felt good and positive throughout gardening diminished the<br>stress of marking G.C.S.E papers."<br>"Unless one of us is unwell or has another appointment, my<br>wife and I invariably go together, as this is enjoyable and<br>motivating for us both. As she is also the primary carer for a<br>family member, we also use this time for discussion, relaxation<br>and as an opportunity to 'de-stress'."   |
|                           |                         | Relaxing                           | "The whole visit was a relaxed and pleasant experience. The activity was not strenuous and the company was good."   |
|                           |                         | Motivation                         | "My 'gym' session gets me started for the day and I feel better<br>when I do that."   |

Note: % of participant mentions refers to the number of participants mentioning activity divided by total diaries.

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| לווואיד - באמוולה                    |                         |                                 | Interpreted by During to Flysical Activity.   |
|--------------------------------------|-------------------------|---------------------------------|---|
| <b>1DF</b> Domains                   | % of                    | Subtheme                        | Examples of related quotes  |
|                                      | Participant<br>Mentions |                                 |   |
| Environmental<br>Context             | 45%                     | Weather                         | "Heat today limited our ability/motivation to do much more<br>physical activity. It's nice to have the sunshine, but when it's<br>continuous, as it has been all week, it becomes draining: especially<br>as we all know that lung capacity decreases markedly with age!" |
|                                      |                         |                                 | "Once again, today's activities will be curtailed by the ongoing<br>heatwave. We had planned for this week either an extensive walk<br>with the dogs around the [city river] or to a local Country Park, but<br>neither would have been feasible."                        |
|                                      |                         |                                 | "Not very much doing today it was disappointing not to be able to<br>walk more but the weather did have an impact on what we could do<br>outdoors."   |
|                                      |                         |                                 | "I didn't go out because of the rain"<br>"Not much activity today. Spent while day in the house as weather<br>is not good and I con't get into the goodan."   |
|                                      | 25%                     | Terrain                         | "The route can be a challenge as it has very little flat runs and a couple of miles which no matter which direction you run there is always a few hills to run up"  |
| Professional<br>Role and<br>Identity | 40%                     | Alternative<br>Responsibilities | "It was a good break, often sitting still most of the day in my chair<br>as I am working from home."<br>"Limited domestic tasks before our meeting from 9:30-11:15  |
|                                      |                         |                                 | "I worked at school for 3 hours invigilating an exam. Quite<br>sedentary apart from occasionally walking round the room and<br>accompanying students to the bathroom. I walked home<br>afterwards. Taken about 15 minutes and I was so glad to stretch my<br>legs"        |
|                                      |                         |                                 | "I would normally do a second class (advanced) after the coffee<br>break but on this occasion I came straight home as I needed to<br>catch up on housework and gardening."  |
| Note: % of parti                     | icipant mention         | is refers to the num            | ber of participants mentioning activity divided by total diaries  |

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