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# **S12-4:** Physical Activity Patterns in Older Adults: From Steps to Context – Optimising Digital Phenotyping for Physical Activity Monitoring in Older Adults by Integrating Wearable Data and Ecological Momentary Assessment

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**Purpose:** Physical activity (PA) is essential for healthy ageing, yet accurately assessing PA in older adults remains challenging due to the biases and limitations of traditional clinical assessments. This study aimed to optimise digital phenotyping strategies for evaluating PA patterns in older adults by integrating ecological momentary assessment (EMA) with continuous wearable sensor data.

**Methods:** Over a two-week period, 108 community-dwelling older adults participated in the study. PA was continuously monitored using Garmin Vivo 5 wearable sensors, while participants provided real-time responses to EMA prompts. Feasibility was assessed based on adherence to EMA, and associations between psychological factors (motivation, self-efficacy) and PA intensity were analysed.

**Results:** The combined EMA and wearable sensor approach proved feasible, with 67.2% overall adherence to EMA prompts (morning: 68.1%; evening: 65.4%). PA was primarily of low (51.4%) and moderate (46.2%) intensity, with activity peaks around midday. Motivation and self-efficacy were significantly associated with low-intensity PA ($R = 0.20$ and 0.14, respectively), particularly in the morning. Notably, no correlation was found between objective step counts and self-reported PA ($R = -0.026$, $p = 0.65$), emphasising the importance of combining both data sources.

**Conclusions:** Integrating EMA with wearable sensor data within a temporal framework enhances the ecological validity and accuracy of PA assessment in older adults. This approach offers valuable, personalised insights that can inform targeted, time-sensitive interventions to promote PA in ageing populations.

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