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S22-2: The Validation of Real-World Digital Mobility Outcomes

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Purpose: Despite the increasing relevance of mobility impairment, there are no tools available to measure it in the real-world. The European Mobilise-D project developed 24 digital mobility outcomes (DMOs) to assess real-world mobility that target walking activity (amount, pattern) and gait (pace, rhythm, variability). The aim of this study was to validate these DMOs in patient populations.

Methods: The DMOs were measured in 2,143 participants of the Mobilise-D prospective cohort study, including persons with Parkinson's disease, chronic obstructive pulmonary disease, multiple sclerosis, and after proximal femoral fracture, recruited from 17 sites in 10 countries and assessed every six months for two years. Construct validity was explored using Spearman/ Pearson correlations and a-priory expectations. Ability to detect change was assessed by standardised response mean in strata defined by self-reported global impression of change and changes in constructs meaningful to patients. MIDs were triangulated using distribution- and anchor-based methods.

Results: Three groups of DMOs were identified: 1) DMOs showing good construct validity and ability to detect change across all diseases and overall cohort (walking duration, number of steps, number of bouts of any duration or >10 s, average and maximum walking speed in longer bouts, stride length in longer bouts), 2) DMOs showing good construct validity and ability to detect change only in some diseases (number of walking bouts >30 and 60 s, bout to bout duration variability, walking speed in shorter bouts, stride length in shorter bouts, cadence in all and longer bouts, maximum cadence, walking speed bout to bout variability, stride length bout to bout variability), and 3) DMOs that exhibited generally poor results in construct validity (average and maximum bout duration, stride duration in shorter and longer bouts, cadence bout to bout variability, stride duration bout to bout variability).

Conclusions: The developed and validated DMOs offer a new opportunity to evaluate real-world mobility and to target outcomes that go beyond amount of physical activity.

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