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**Disability assessment in the Google Maps era: a feasibility study to explore a new clinical opportunity**

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(Article begins on next page)

## Abstract

**Objective:** The aim of this study was to investigate the feasibility of a large-scale trial to test the effectiveness of Google Maps application in order to improve the evaluation of Ambulation Score (AS) and the related EDSS in clinical practice.

**Background:** AS is the most used scale to assesses gait impairment in people with Multiple Sclerosis (pwMS). AS relies mostly on the maximum distance a patient can walk without rest (maximum walking distance, MWD). In clinical practice doctors traditionally rely on patients' estimates concerning the walked distance. Several studies showed the inaccuracy of such distance estimates and therefore the unreliability of disability assessment in clinical practice.

**Design/Methods:** 243 pwMS were recruited in five Italian MS Centers.

We collected 1. demographical and clinical data ; 2. the AS based on pwMS referred MWD (perceived AS, pAS) and, consequently, the perceived EDSS (pEDSS); 3) the AS based on MWD identified on Google Maps (gmAS) and, consequently, the google maps EDSS (gmEDSS). We evaluated the agreement between the two latter measurements and whether demographic and clinical data might have influenced the agreement. Finally, in a subgroup of 75 pwMS we evaluated an actual AS (actAS), objectively measured, and we tested the agreement among the pAS, the gmAS and the actAS.

**Results:** pEDSS and gmEDSS were coincident in 169/243 (69.55%) pwMS. In 74/243 (30,45%) were different (higher/lower). These two groups were significantly different for FSS ( $p= 0.01$ ) and PHQ-9 ( $p = 0.002$ ) and frequency of progressive phenotype (OR = 2.8, 95% CI 1.1 – 7.11,  $p = 0.03$ ). The pEDSS and the actEDSS were coincident in 45.3% of pwMS. gmEDSS and the actEDSS were coincident in 57.3%

**Conclusions:** In conclusion, we suggest that Google Maps application could be easily applied in a real-life clinical setting to calculate the AS and that is suitable to be evaluated in future clinical studies.

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