

Screening risk of falls in Parkinson's disease population living in underserved areas

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Objective: To verify the feasibility of the Balance-App to assess the risk of falls in the PD population living in underserved areas.

Background: The screening of falls portrays a huge challenge in Parkinson's Disease(PD). Digital technologies are promising tools to change research and treatment monitoring in PD. It is unknown which is more feasible and low coast digital system to screen fall rates of PD from underserved areas.

Method: In this observational cohort study, we collected a single clinical setting assessment with 197 PD participants (1-4 H&Y), age 67,2, 52,8% men,with or without gait impairments, living in underserved areas in Brazil. Balance-App consists on a smartphone-based digital assessment and includes a self-report of falls by the clinical questionnaire and an objective measure collected by stabilometric variables. Participants were instructed to respond to the Balance-App's interview (Risk of falls questionnaire and Fragility scale). After that, they were assessed by a physiotherapist using the Mini-BESTest, and the Timed up and Go test (TUG). At the same time, Center of Body Mass data was collected by a gyroscopic and an accelerometer allocated in a smartphone attached to the patient's body by a belt. The Balance-App collect and process the data throughout a digital platform.

Results: In total, 58% of PD participants were in fragile profiles. The App generated participants' risk of falls, scoring as super high (7%), high (16%), medium (75%) and low (2%). There was a significant difference between the severity PD stage and the App's scores ($p<0.005$). We found the risk of falls scores obtained by Balance-App was significantly corelated to MDS-UPRDS III (item-3.12)($p<0.004$), Mini-BESTest ($p<0.001$), and TUG ($p<0.003$).

Conclusion: Balance-App can provide sensitive fall rates and is feasible to screen the risk of falls in the PD population. Further studies should investigate the Balance-App test-retest reliability, validity, and clinical meaningfulness in future trials with PD people who live in underserved areas and has to restrict access to health care.

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