Measuring neuropsychological functions relevant for stroke diagnosis on a mobile phone application.

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Abstract

Stroke is one of the primary causes of neurological disability in the world, with an increasing prevalence in the past 17 years. Post stroke cognitive impairment (PSCI) is an inescapable outcome of stroke, observed in more than 30-40% of the cases. Executive functioning and memory impairments are prevalent after stroke. These impairments severely impact the activities of daily living (ALD) in stroke patients. Although the impact of these cognitive impairments is severe, there is a scarcity of ecologically valid, reliable, and easily available assessment tools that could also capture mild cognitive impairments. To overcome these drawbacks and develop an easily accessible assessment tool, a mHealth tool was developed measuring stroke relevant cognitive functions using MovisensXS mobile phone application. The tool included measures of object recognition, delayed visual memory, fluid intelligence and instrumental and functional activities of daily living. These measures were tested on healthy elderly German population, between the ages of 50 to 80 years. Further, they were psychometrically evaluated using item response theory (IRT) modelling techniques like item factor analysis (IFA) and Rasch modeling. The tests were all consistent with the Rasch model, providing item difficulties and person parameter to conclude the ability level of test takers. The present study provided normative data to compare the performance of stroke patients.