PP-08: Development of an online home-based exercise intervention to reduce the risk of falls and to improve the mobility and gait in diabetes mellitus:a study protocol

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Introduction: Exercise interventions are found to be effective in reducing the risk of falls in older adults with diabetes mellitus (DM). However, there are no home or clinic based interventions which can be used with minimal supervision. Furthermore, a digital intervention program based on validated data with a valid monitoring tool is not present in literature. The aim of this study is to develop a digital exercise intervention and to test its effectiveness to reduce the risk of falls, fear of falling, mobility and gait characteristics in older adults with DM.

Methods: A home-based digital exercise programme will be developed based on the neurophysiological and cognitive function data already obtained from patients with DM (n=103) by the principal investigator. Intervention will be given to the study group and the control group will receive general fall prevention advice. The programme will be accessible through a smartphone or a tablet. Exercises will be instructed in short video clips imaging older persons doing the exercises, and the user-interface will be clean and uncomplicated. Participants will have the opportunity to select up to 12 exercises, one from each category. Categories are upper limb strengthening (three groups), lower limb strengthening (five groups), balance training (two groups) and cognitive training (two groups). The primary outcome measure will be the number of falls during the intervention period assessed with fall calendars. Neuropathy symptoms and examination scores, physiological profile assessment (PPA), iconographical falls efficacy scale (Icon-FES), timed up and go test (TUG), balance assessments and gait analysis will also be performed before and after the intervention.

Conclusions: The generated exercise programme, if effective, could be utilised for people with DM to reduce the risk of falls. Hence, we can reduce the fear of falling and improve the quality of life of older adults with DM. The possible reduction in morbidity and mortality related to falls will contribute positively to the quality of life and economy.

Keywords: diabetes mellitus, risk of falls, fear of falling, exercise intervention