

Poster # 38

Title of poster: Feasibility of a Smartphone Delivered Aerobic and Cognitive Exercise Program for Community-Dwelling Older Adults

Abstract

Background: Current literature provides evidence for the beneficial effects of physical and mental activities on cognitive functioning of older adults at risk of cognitive decline. In fact, the According to existing epidemiologic studies, there is little dispute that type-2-diabetes (T2D) is linked to cognitive impairment. 2011 World Alzheimer report outlines the importance of providing routinely individualized cognitive stimulation programs as a part of care for older Canadians. Emerging health technologies, including mobile health (mHealth) via smartphones, have shown promise in extending the reach of preventive and management solutions for patients with cognitive impairment. Currently, hHowever, presently there is a lack of consistency in the application and availability of cognitive training in geriatrics. This research group has developed the HealtheBrain smartphone application which is currently available on the Apple App store for: iPod touch 4+, iPhone 3GS+ and iPad 2+. The HealtheBrain smartphone application aims to provide an easily accessible mind-motor exercise program known as Square-Stepping Exercise (SSE) developed by Shigematsu and Okura (2005). The SSE task uniquely challenges participants to utilize their memory and balancing skills as they watch, recognize, memorize and executefollow step patterns demonstrated on a 4 by 10 square-patterned floor mat (in-person program) or diagram (smartphone application). Preliminary evidence indicates that the mindmotor exercise program leads to improvements in verbal learning and, memory, as well as verbal fluency and overall global cognitive functioning, in community-dwelling older adults without dementia, diastolic blood pressure and fitness (Gill et al., 2014).

Objectives: The aim of this study is to develop, implement and evaluate the HealtheBrain smartphone application.

Methods: Two samples (7-8 participants in each) of community-dwellingT2D older adults who previously consisting of those who have completed a an previous aerobic and cognitive exercise study with our group (including both participants who are and and those who are not experienced with mind-motor exercise) programs will be recruited. Both samples of participants will be asked to use the HealtheBrain smartphone application for two weeks. Upon completion of the two-week exercise programFollowing this two-week period, participants will complete a 25-item questionnaire, intended to evaluate the feasibility, utility, value and design of the HealtheBrain smartphone applications and independent sample t-tests will be performed on the pooled data to determine general linear relationships. Cronbach's reliability alphas will be used to assess internal consistency of the questionnaire. Thematic analysis will be used to interpret participants' responses to short answer questions.

Anticipated results: It is anticipated that the cognitive exercise smartphone application will receive positive feedback from the T2D patients. Additionally, the questionnaire will provide the investigators with valuable feedback about design features of the smartphone application. Significance: Findings from the questionnaire will establish grounds for a HealtheBrain smartphone application pilot study, which will determine the efficacy of mobile health technology in T2D as assessed by global cognitive functioning, specific cognitive domains (memory, reasoning, concentration and planning), mobility (balance, falls self-efficacy), and vascular outcomes. The smartphone application will extend the reach of the mind-motor exercise program to underserved populations in rural communities with limited transportation options and limited access to exercise programs. Overall, these studies will take us a step closer in building and implementing evidence-based mHealth mind-motor exercise mHealth programs to prevent life-limiting illnesses.