**Performance of the elderly on the execution of virtual reality activities and cognitive evaluation after a prevention program of multi-components falls**

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**Introduction:** In addition to the new demands arisen with the aging process, many physical and cognitive declines are also related to this process, which considerably increases the risk of falls and overloads for Brazilian Health System (SUS - of Portuguese, Sistema Único de Saúde) in all its levels (1). Thus, aiming at maintaining and improving quality of life, as well as physical and cognitive aspects, it is recommended to create a multi-component fall prevention program for the elderly. Cognitive stimulation, physical activity, dual task training and health education are thought to be relevant features to be part of such program.

**Materials and Methods:** This is a cross-sectional and descriptive study. Seven older adults (5 females, 2 males), mean age 70.5 years old (± 8.35), education 10.2 years (± 5.07), mean weight of 70.85 kg (± 9.76) and height 1.64 m (± 0.09). The instruments used were: Mini Mental State Exam (MMSE); Addenbroke's-revised (ACE-R); Brief Cognitive Battery (BCB), simple Time Up and Go (TUG) test, cognitive TUG and the time in seconds to complete the assembly of a puzzle controlled by the participant's upper limbs. For this evaluation was used the GesturePuzzle gesture recognition application, developed in the Immersive, Interactive and Collaborative Visualization Laboratory (LaVIIC) of the Department of Computer Science at UFSCar. The paired t-test was performed for the parametric variables and Wilcoxon for the non-parametric (SPSS) (p≤0.05). Pre and post evaluations were made, respectively, before and after the intervention of a multicomponent fall prevention program, which happened in 16 sessions.

**Results:** A statistical difference was found between the pre (45,14s) and post-tests (32,43s) (p = 0.042). There was no statistical difference on the other tests.

**Discussion:** As an alternative to falls risk assessments, the use of Virtual Reality (VR) may be a prominent factor in screening capacity. The interest in the use of this resource has increased as evaluation and not intervention; also it has been used with individuals with different characteristics (2). VR equipment can contribute with instruments that evaluates body posture, which can make such evaluations easier and also aid to adapt the accuracy of the postural equilibrium (3). Moreover, this differentiated approach can serve as an attractive factor for the elderly to participate in these tests. It also allows to verify whether physical and cognitive training was beneficial or not for each participant (4), as shown by the results of this study, which proved that after the use of a differentiated program, the assembly time of the puzzle decreased significantly.

**Conclusion:** This experiment was done with older adults participants of a multi-component fall prevention program and suggest their performance was improved in VR tests that measure attention. This indicates VR as being an interesting tool to evaluate the elderly.

**References:** [1] Brazil. Health Portal, 2013.Available in:http://portalsaude.saude.gov.br/index.php/cidadao/principal/english. [2] Mirelman A et al., Trial 388(10050): 1170-1182, 2016; [3] Wright WG et al.,Journal [Disability and Rehabilitation](http://www.tandfonline.com/toc/idre20/current) 17(07): 1-9, 2016; [4] [Donath L](http://www.ncbi.nlm.nih.gov/pubmed/?term=Donath%20L%5BAuthor%5D&cauthor=true&cauthor_uid=26886474) et al., Sports Med 46(9): 1293-309, 2016.