

AZ@GAME: Alzheimer and associated pathologies game

G. SACCO, G.B. SADOUN, J. PIANO, P. FOULON, P. ROBERT. **AZ@GAME: Alzheimer and associated pathologies game for autonomy maintenance evaluation.** *Gerontechnology* 2014; 13(2):275; doi:10.4017/gt.2014.13.02.181.00 **Purpose** Alzheimer's disease and related pathologies represent a major challenge for health care systems as they cope with aging populations. It is therefore important to continuously develop tools that help clinicians to better diagnose and treat patients. Enriched Environment (EE), which promotes physical and cognitive stimulation through physical activities, cognitive challenges, and social interactions, appears to be a powerful non-pharmacological method to decrease the neurodegenerative process and cognitive impairments typically seen in Alzheimer's patients. The cognitive-enrichment-hypothesis states that an individual's behavior (including cognitive activity, social engagement, exercise, and other behaviors) has a meaningful, positive impact on their level of effective cognitive functioning in old age. This is the underlying idea for the development of Serious Games (SG). The Az@Game project is a laureate of the French Investment Funds for the Future called 'E-health and autonomy in their living environment thanks to digital technology'. One objective of Az@Game is to develop a SG that provides physical and cognitive stimulation for patients suffering from Alzheimer's disease and related pathologies. The aim of this study is to evaluate the usability of this SG in elderly and patients suffering from Alzheimer's disease and related pathologies. **Method** 'Xtorp', is a MMORPG (Massively Multiplayer Online Role Playing Game) SG based on a submarine game scenario. The player takes control of a submarine, and progresses by fighting other ships and completing missions. The goal is to become the best player within one month, in a contest between players and several artificial intelligences. This game offers two focuses: evaluation and stimulation. Concerning evaluation, 'Xtorp' proposes five video gaming tests, inspired by four standardized neuropsychological tests and one physical test. The performances on the standardized tests and on the video gaming tests will be compared. Concerning stimulation, subjects follow the 'Xtorp' training scenario for 30 to 60 minutes per session, in 3 sessions per week for 4 weeks. A trained exercise leader supervises all sessions. Players use a motion capture system (Kinect for PC) to control their submarine; for example, to move forward, they walk in place; to turn left, they use their left arm, and so on. Cognitive and physical test batteries are used before and after the training program to assess possible changes in capacity or ability. **Results & Discussion** Enrollment started in January 2014. During evaluation, we expect to find a linear relationship between performances in real standardized tests and video gaming tests. Concerning stimulation, we expect all participants to complete the training program scenario, and expect to observe physical and cognitive improvements, especially among healthier participants.

Keywords: health & self-esteem, Alzheimer disease, serious game, training, evaluation

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