

### **FC5: Predicting adherence to psychotherapy with mHealth data using deep learning**

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**Objectives:** Effectiveness of psychotherapy depends on patients' adherence to between-session homework (HW) to practice therapeutic skills. mHealth apps can offer continuing reminders, although frequent reminders overwhelm or burden patients and therefore are ineffective. Predicting likelihood of completing daily HW and sending contextual reminders has the potential to improve HW adherence and therefore improvesymptoms.

**Methods:** Depressed older participants (N = 51) undergoing psychotherapy provided daily active ratings on mood, anhedonia, stress and pain via an mHealth app. Data on activity, mobilization, sociability and sleep passively were also recorded via device sensors (e.g., microphone, accelerometer, GPS etc.). Using active and passive mHealth data, we developed predictive models of daily home-work completion status using a naïve semi-supervised deep learning algorithm. Prediction accuracy was determined via time-dependent cross-validation.

**Results:** Study participants had a mean (SD) age of 71.4 (7.76) years, mean (SD) of 14.9 (2.93) years of education, mean (SD) BIS/BAS total of 22.6 (3.36), mean (SD) MADRS total score of 20.4 (6.04) and 88.2% were of female gender, 29.4% were single, 83.8% were of non-Hispanic ethnicity, 58.8% belonged to Caucasian race and 38.2% practiced Catholic religion. With 4700 person-days HW completion response, our models show an AUC of 84.7% (sensitivity = 76.2%; specificity = 80%) estimated by cross-validation.

**Conclusions:** This paper demonstrates the feasibility of predicting adherence to psychotherapy in depressed older adults using actively and passively collected mHealth data. Digital interventions based on such predictive models can potentially increase adherence to psychotherapy and thereby improve its effectiveness without increasing the user notification burden.

**Keywords:** mHealth, artificial intelligence, psychotherapy adherence

### **FC6: Impact of work activity on cognitive functioning in older adults**

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**Objectives:** The aim of this study was to analyze the impact of maintaining professional activity on cognitive functioning at advanced ages.

**Methods:** The sample comprised 131 people aged 60 years-old and older (M = 68,15 years) of whom 41 were still working (30 women and 11 men, Mage = 65.24), and 89 retired (74 women and 15 men Mage = 69.48). To assess participants' cognitive functioning the following instruments were used: Rey-Osterrieth Complex Figure Test, Digit Span Test, Trail Making Test (TMT), Verbal Fluency Test and Boston Naming Test (Short Form). Since age differences among participants of the two groups were found an ANCOVA test was used, and age was included as a covariable.

**Results:** Statistically significant differences were found between the two groups in the Part A of TMT ( $F = 7.383$ ,  $p < 0.05$ ) and the Boston Naming Test (Short Form) ( $F = 3.495$ ,  $p < 0.05$ ). Compared with retired participants those who were still active had better scores on both measures.

**Conclusions:** Work-related activity in old age has a positive influence on cognitive functioning and can contribute to older people's cognitive reserve and to maintaining better attention, naming or word retrieval performance. Thus, in order to maintain good cognitive functioning, when older adults retire, they may need to substitute work with stimulating and challenging activities.

### **FC7: Effects of a multidomain cognitive stimulation program in older adults**

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**Objectives:** The aim of this study was to ascertain the influence of a six-month multidomain stimulation program on cognitive functioning.

**Methods:** The sample comprised 25 older adults 60 years-old and older (Mage = 66.08 years), of whom 96% were women and 54% had high education. The intervention program had a duration of six months and was implemented in a group format in one-hour sessions on a weekly basis. Lessons on neuroprotective factors, training in practical compensatory strategies to improve daily performance, cognitive training exercises and recreational cognitive stimulation activities were included. In order to analyze participants' cognitive functioning the following instruments were used: Mini-Mental State Examination, Rey Complex Figure Test, Digit Span Test, Stroop Test, Trail Making Test (Part A and Part B), Verbal Fluency Test, Boston Naming Test (Short Form) and Neuropsi Verbal Memory Subtest. Wilcoxon test was performed to test the impact of the intervention program on participants cognitive functioning.

**Results:** Statistically significant differences were found after the six-month intervention in verbal memory encoding ( $W = -2.772, p < 0.05$ ), in spontaneous verbal memory retrieval (freerecall) ( $W = -3.456, p < 0.001$ ), in verbal recognition memory ( $W = -3.184, p < 0.001$ ), in spontaneous visual memory retrieval ( $W = -2.056, p < 0.05$ ), and in naming by visual confrontation ( $W = -2.521, p < 0.05$ ). In all cases, participants increased their scores after taking part in multicomponent a six-month multidomain stimulation program

**Conclusions:** One of the biggest concerns among older people is the loss of cognitive abilities that may occur with ageing. Cognitive stimulation programs, if sufficiently comprehensive, can be a good tool to maintain and improve cognitive functions as we age.

### **FC8: Specific protocol for individual Psychotherapy based on Cognitive Behavioral Therapy for people with Mild Cognitive Impairment (MCI) and Mild Dementia (MDI)**

**Author:** Paula Soledad Brovia, Sr.

**Objectives:** To discuss a proposal for a cognitive behavioral psychotherapy protocol for people with Mild Cognitive Impairment and Mild Behavioral Impairment framed within psychosocial treatments.

**Methods:** The lack of a specific psychotherapy protocol in Latin America for the selected population will be presented, as well as the need to complement cognitive stimulation treatment with cognitive behavioral psychotherapy for the corresponding cases. The literature explored in this theoretical framework will be addressed and the steps to follow in the aforementioned project will be proposed.