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Short Communication

Cognitive Stimulation of Normal Elderly, Persons with Subjective Cognitive Decline, Mild Cognitive Impairment and Dementia

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Pharmacological as well as non-pharmacological approaches (cognitive, neurophysiological, nutritional supplementation, electric or magnetic stimulation, psychosocial therapeutic) and multi-domain interventions have been proposed for the prevention and management of cognitive disorders of normal elderly people, persons with Subjective Cognitive Decline (SCI), Mild cognitive Impairment (MCI) and dementia. The outcomes of the most current reviews on cognitive stimulation are listed below.

In people with MCI, interventions on controllable factors like physical activity and food give cognitive protection, enhancing their quality of life, independence and functionality**.** The studies' diversity makes it difficult to provide more specific recommendations [1]. However, our experience in Greek dementia Day Centers with interventions with body exercises [2] and use of natural products such as Crocus [3] and Extra Virgin Olive Oil [4] gave us very promising results.

According to a recent review, cognitive therapies can be a good alternative for patients with amnestic MCI. They increased overall cognitive performance after the session, but they also seemed to improve particular cognitive areas immediately following the intervention and during follow-up. Our ponders moreover bolstered these comes about. In any case, more ponders are required to analyze the potential benefits of cognitive intercession on amnestic or multi space MCI [5].

Dance practice was associated with improved functional connectedness, cognitive performance and increased brain volumes. The outcomes of a recent study shows the view that plasticity induced by dance training among healthy elderly people is the cause of improvement [6]. Our studies showed improvement with both dancing programs either Greek traditional [7] or international [8]. The results of another study suggest that participation in regular aerobic exercise can improve cognitive function in older adults with MCI [9].

Altered Resting-State Functional Connectivity in language and control networks subsequent to a second language training programs was associated with improved global cognition in older adults. This review ends with a brief discussion of potential confounding factors in bilingualism research and conclusions and suggestions for future research [10]. Our studies with programs of English or Ancient Greek lessons at our day centers showed also very interesting results and the studies are under preparation.

Despite statistical in favor of exergames differences in MMSE and MoCA, these results should be interpreted with caution due to methodological heterogeneity [11]. Combined intervention produced cognitive benefits in older adults with MCI and showed limited superiority compared to single cognitive intervention [12]. We had very interesting results using new technologies in patients who were carries of a risk gene for Alzheimer's Disease [13]. We also used smart monitoring technology for long-term monitoring of people with cognitive impairments and compared traditional monitoring with meaningful monitoring [14].

Cognitive tele-enhancement treatment could be a good alternative to face-to-face intervention. According a recent review the importance of applying preventive cognitive interventions to subjects with initial subjective memory complaints is suggested. Remote modalities seem to facilitate the application of such interventions [15]. We had much experience during the last pandemic which showed us that the results are almost similar with those face to face (Tsatali., *et al* under publication, 2021).

Transcranial Magnetic Stimulation and Transcranial Direct Current Stimulation, two of the most popular technologies, use electrical fields generated non-invasively in the brain to long-lastingly enhance the excitability/activity of key brain regions contributing to relevant cognitive processes. A recent comprehensive critical review presents proof-of-concept evidence and meaningful cognitive outcomes in eight of the most prevalent neurodegenerative pathologies affecting cognition: Alzheimer's Disease, Parkinson's Disease, Dementia with Lewy Bodies, Primary Progressive Aphasias (PPA), behavioral variant of Frontotemporal Dementia, Corticobasal Syndrome, Progressive Supranuclear Palsy, and Posterior Cortical Atrophy. Nonetheless, these approaches are yet to demonstrate a meaningful therapeutic impact and changes in prognosis [16]. We have no experience with this kind of interventions yet.

Conclusively, the field of Cognitive stimulation in elderly people with cognitive problems remains promising but, to make further progress, research efforts need to take in account the latest evidence of the anatomical and neurophysiological features underlying cognitive deficits in these patient populations. Moreover, as the development of *in vivo* biomarkers are ongoing, allowing for an early diagnosis of these neuro-cognitive conditions, one could consider a scenario in which treatment will be personalized and made part of a cognitive rehabilitation program, or useful as a potential adjunct to drug therapies since the earliest stages of such diseases.

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