

## **Cognitive and Physical Activities Intervention Improves Inhibitory Function in elderly with Subjective Cognitive Decline: An Event-related Potential Study**

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### **Abstract:**

**Introduction:** Subjective cognitive decline (SCD) refers to a self-experienced cognitive deterioration along with intact performance in neuropsychological tests and is strongly associated with higher risks in the development of Alzheimer's disease (AD). Since SCD occurs years before detectable clinical changes of AD, it is crucial to spot out people with SCD and do further prevention. Several large-scale studies using cognitive and physical activities intervention on SCD have shown no significant improvement in the neuropsychological tests. The lack of sensitive measures might be one of the reasons accounting for these null findings.

**Objectives:** This study aimed to determine whether such preventive intervention benefits individuals with SCD in cognitive function using event-related potentials (ERP). Inhibitory control, one of the important facets of cognitive function, was particularly examined since it is essential for the elderly to perform goal-directed activities in daily life.

**Methods:** Thirty community-dwelling older adults with SCD were randomized into control (n=15, receiving health education) and intervention (n=15, receiving cognitive and physical activities) groups. The intervention was performed 2 hours/day, 2 days/week, and sustained for 6 months. During ERP



recordings, we adopted a Go/Nogo paradigm, where subjects were instructed to respond to Go (70%) and withhold responses to Nogo (30%) trials. Amplitudes and latencies of N2/P3 components, which represent electrophysiological correlates of inhibitory control, were determined. ERP data were processed with EEGLAB software, and Mann-Whitney U tests were used to evaluate the between-group differences.

**Results:** Despite no significant differences in the score changes of cognitive tests and ERP accuracy rates between control and intervention groups, the ERP results showed that compared to the control group, the intervention group exhibited shortened N2 latencies ( $p=0.01$ ), suggesting improved inhibitory function.

**Conclusion:** Cognitive and physical activities are beneficial to SCD in terms of inhibitory function, as evident by electrophysiological recordings.

**Keywords:** *Subject cognitive decline; Multimodal intervention; Event-related potential; Inhibitory function*