

Editorial

## Synergistic Effects of Physical and Cognitive Training in Older People

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Aging is a physiological or natural process with the physical and cognitive decline with the biological age. Physical and cognitive decline decrease the quality of life, results health problems, and functional limitations in older people. However, the rate of the decline alters from person to person depends on some individual structural and neurochemical differences. There is a normative trends in the literature which suggests that physical activity improves, or ameliorates both physical [1, 2] and cognitive decline [3] during healthy aging and also cognitive impairment such as dementia, or mild cognitive impairment [1]. In a previous study, van Uffelen et al. reviewed in detail of studies on several types of physical activity such as aerobic, flexibility, strength, or balance exercises alone, or in several combinations, and have been shown beneficial effects on cognitive decline [1]. In their review, exercise intensity in the analyzed studies was varied between 30% to ventilatory threshold, and the duration of the exercise was varied between 6-52 weeks, and in most programs, exercise sessions were supervised by physical therapists, exercise physiologists, trained instructors, or researchers. Cognitive performances of the study groups were evaluated by using MMSE scores. In conclusion, they stated that "in one third of the studies among subjects without cognitive decline and two thirds of the studies in subjects with cognitive decline, beneficial effects of aerobic or strength exercise on certain aspects of cognition have been observed" [1].

On the other hand, cognitive training is one of the effective and safe ways for delaying the onset of cognitive deterioration in aging process. Mental stimulation results environmental enrichment, and triggers the release of several growth factors which are shown to increase the neural survival, proliferation and synaptogenesis in the brain [5]. Valenzuela et al. investigated in a systematic review of randomized clinical trials with longitudinal follow-up whether the mental activity levels might alter dementia risk. In their study, they reviewed the studies containing cognitive exercise training using repetitive cognitive task for more than one week in older adults greater than 50 years of age [6]. In the analyzed studies, several interventions of cognitive training such as computer-based training, reasoning training, information processing speed, memory, and problem solving training, or multifactorial training covering encoding with imagery and method of loci, attentional task exercises and relaxation were investigated during 3-72 months follow up period. They found a strong effect size for cognitive exercise interventions compared with the control conditions. Authors also pointed out to evidence of preliminary clinical trials which suggest that combining physical and mental exercise may produce greater cognitive benefits over time than either intervention alone. They concluded that the capacity for such synergistic potentiation clearly needs further evaluation [6].

Although a remarkable evidence suggests the synergistic effects of physical and mental training to delay cognitive and physical impairment during aging process, relatively small number of studies were done in the population-based interventions. It is an important issue that the health care professionals and exercise supervisors are required to extend the implemented cognitive and physical activity programs into the community-based programs in older adults. An appropriate training program should be built according to the expectations on the target improvement and the characteristics of the participants. Also, implemented cognitive training sessions into the physical exercise program should be evaluated by follow up from the efficiency of the responses during, and following the cessation of the program in older people.

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