

Abstract

Physical activity may have a positive effect on cognitive function in older adults due to the relationship between the secretion of certain exergins and their neuroprotective effects. What type of physical activity is most effective in terms of its effect on cognitive function in humans is an important scientific challenge. The main aim of this study is to investigate the effects of dance therapy on the exerkines irisin and Brain derived neurotrophic factor, which have been shown to be associated with synaptic plasticity, neurogenesis and neuroprotection in seniors over 65 years of age, in the context of their baseline levels of cognitive and physical performance. As a secondary aim, the effect of dance therapy on cognitive function, strength and physical performance as measured by specific tests will be investigated. The effect of dance on blood levels of irisin and BDNF in the context of cognitive and physical fitness has not yet been clearly demonstrated. The study is designed as a randomized, blinded, controlled trial. Based on a power analysis, we recruited Czech, normally independently living older persons (age ≥ 65 - ≤ 80 years), 39 participants finished the study. We measured cognitive abilities, physical fitness and mood and collected blood samples immediately before and after the intervention. Therapy by dance was performed twice weekly (90 min) for 12 weeks in 2021. The non-parametric Mann-Whitney U-test was used to compare the groups, the non-parametric Wilcoxon signed rank test was used to test the hypothesis of before and after within-group changes, the non-parametric Mann-Whitney U-test was used to test the hypothesis of the effect of the intervention, and the generalized linear model was used to estimate the magnitude of the relationship of baseline levels in the variables tested. The intervention had a statistically significant positive effect on blood levels of the BDNF exerkin compared with the control group, as well as on numerous cognitive domains. Baseline levels of cognitive function and physical fitness were statistically significantly related to effect size. The study also included a qualitative part. Themes from the focus groups included three main themes. Dance therapy as a means to physical activity, health benefits of dance therapy, and social engagement through the intervention. In conclusion, we summarize that some exerkines can be modulated by dancing and may play a key role in the context of cognitive function and mood in healthy older adults. At the same time, older adults accept dance therapy as a means of physical activity and are happy to attend due to subjectively observed health benefits or social engagement. Our study thus joins many recent studies that recommend dance as a nonpharmacological promising program for the aging brain.

Key words: aging, dementia, irisin, BDNF, brain plasticity, somatics, memory