



Introduction to the special issue on Neuroscience & lifestyle: From neurobiology to mental health

A balanced lifestyle is essential not only for physical, but also for mental health. In the past decade an increasingly body of evidence also associates physical activity, diet and distress with a healthy aging process. Research with lifestyle interventions consistently associated the improvements in cardiorespiratory fitness, muscle function and metabolic efficiency with mental health and quality of life. Progressively, neuroscientists also directed their attention to the relationship between brain function and life quality and healthier lifestyles. In fact, several studies have shown benefits of a suitable lifestyle to mental health. Therefore, this Special Issue gathered clinical and experimental research studies aimed to further understand effects of lifestyle-related interventions (physical activity, nutrition and stress management) on mental health. This special issue comprises 3 review and 6 original research papers, with a focus on the topic of lifestyle and neuroscience.

Aging progressively impairs both physical and cognitive function of older adults increasing the prevalence of most mental illnesses. Crespo and colleagues (Crespo et al., 2020) brings evidence that cognitive function plays an important role in distinct aspects of health-related outcomes and literacy in DM older individuals. Lower cognitive condition in DM individuals presented inferior health literacy regarding physical activity, nutrition and disease management, potentially making DM control difficult for these individuals. In line with this finding, Lima and colleagues (de Lima et al., 2020) brought an interesting study that looked after an association between cardiometabolic and mental diseases, such as, Alzheimer, mild cognitive impairment and major depressive disorder with the increased reliance on polypharmacy. Given the contribution of decreased cognitive condition to mental disease, Silva and colleagues (de Oliveira Silva et al., 2020) investigated how the cognitive and motor capacity are affected during the evolution of patients in different stages of Dementia. The authors suggests that simple (cognitive) and dual (cognitive-motor) tasks might be valuable tools for disease treatment and control regarding functional capacity. Interestingly, Oliva and colleagues (Pereira Oliva et al., 2020) brought a study of systematic reviews that investigated the importance of dual task-based training paradigms. In this study, the authors evaluated the reviews quality and relevance as well as the confirmation that this type of training provides cognitive and motor benefits to older patients with or without mental diseases. Using a dual-task exercise paradigm, Alves and colleagues suggested an ultrafast prefrontal cortical activity adaptation in residents of long-term care home after an acute session of virtual reality-based exercise (Alves et al., 2021). In line with the importance of lifestyle changes to mental health management, Dias and colleagues (Dias et al., 2020) reviewed current knowledge associating caloric restriction with cognition and neurobiological aspects of brain function.

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The authors evaluated recent animal-based experimental studies and discussed the impact of type, duration and intensity of different caloric restriction protocols on brain structures adaptive response. Recent advances in nutritional aspects associated with brain development and function also suggest the importance of sirtuins in cognitive capacity as reviewed by Moraes and colleagues (Moraes et al., 2020). In this review, the authors provide an extensive analysis of resveratrol strong antioxidant activity, inhibition of pro-inflammatory factors such as the nuclear factor kB (NF-kB) and modulation of multiple signaling pathway effectors related to cell cycle programming and synaptic plasticity. Complementarily, in a psychomotor performance set up, Machado and colleagues showed that caffeine supplementation effects on cognitive processes might act synergistically with exercise (Machado et al., 2020). Finally, Souza and colleagues (de Souza et al., 2020) combined animal research and retrospective diagnostic case and control study in patients in a study that sought to evaluate a causal connection between anxiety disorders and cancer development.

In short, this special issue gathered different research perspectives regarding the impact of declined cognitive function and aging on health and quality of life in distinct research paradigms. In addition, research aimed at different lifestyle interventions provide further evidence reinforcing the beneficial aspects of these potential tools for mental health management.

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