



#### LETTER TO THE EDITOR

## Physical exercise during coronavirus disease (COVID-19): Recommendations to remaining active in periods of confinement

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**Abstract:** The period of social isolation during the COVID-19 pandemic has led people to adopt behaviors that were not previously part of their routines. The need to maintain an active lifestyle, with the adoption of an exercise regimen, has been reinforced by the scientific community for the maintenance of the immune and mental condition. Thus, we point out the need to observe the scientific guidelines on physical exercises during social isolation.

**Key words:** coronavirus, pandemic, physical activity, social isolation.

The global recommendation during the coronavirus disease (COVID-19) pandemic, especially older people, includes social isolation (SI), which involves staying at home and, avoiding contact with other people, probably for a prolonged period of period, currently expected to be between three to four months.

One of the themes that sparked a worldwide discussion would be the effectiveness of regular physical exercise (PE) or maintaining an active lifestyle to strengthen the immune system during periods of SI. The current pandemic presents a big challenge to maintain an active lifestyle and/or, PE routine. The relationship between immune function and PE has been extensively studied in recent years. Evidence indicates that moderate and/or, vigorous exercise has anti-inflammatory effects, suppressing abnormal production of inflammatory cytokines (Nieman & Wentz 2019).

According to published reports, PE has many health benefits, one of which is the increase the immune system and the protection of organs, improving of anti-infective and antioxidant agents, as well as a modulator of the gut microbiome, affecting the host's immune pathways, improving energy homeostasis and also releasing certain neuroendocrine and immune-modulatory factors that may lower inflammatory and oxidative stress (Campbell & Turner 2018). Epidemiological evidence shows that PE has a beneficial or at least non-detrimental effect on the immune response and potentially reduces the risk and severity of viral respiratory infections (Kohut et al. 2002).

Also, regular PE promotes adaptations in the physiological system that enables the transport of macro and micronutrients, removal of metabolism by-products, greater cardiorespiratory resistance and muscle strength fitness, improvements that benefit the innate and adaptive immune system response. However, due to recent pandemic, the relationship between the immunity, PE, and COVID-19 infection has been speculated on social media. Despite recent evidence that exercise improves the response to the vaccine's effectiveness against the Influenza Virus, by cell-mediated immune responses of influenza-specific lymphocyte proliferation, antimicrobial peptides, and

anti-inflammatory expression cytokines (Kohut et al. 2002), there is no evidence that regular exercise or have a 'history of athlete' promotes defense against COVID-19.

The last recent evidence makes clear that not only the accumulated effect of PE, but also of an active lifestyle are beneficial for immunity. In this sense, having knowledge and self-perception of one's health status, worrying about the quality of food and sleep shown to improve quality of life, mental health, and immune function when compared to inactive lifestyle. The confinement associated with physical inactivity can have other indirect consequences for immune health, and this is the point that we must keep focused on the negative psychosocial consequences of SI. Biological correlates of SI can be investigated in epidemiological studies, and have documented associations between lack of SI, anxiety and high levels of glucocorticoid response, such as cortisol, and also, negative cardiovascular, metabolic, and neuroendocrine process. Cortisol levels increase during the long periods of the SI period can inhibit head critical functions of the immune system (Grant et al. 2009).

However, exercise prescription should focus on mitigating possible direct and indirect negative effects caused by chronic stress associated with SI, such as decrease main functions of the immune system, reduction of physical activity and functionality and also anxiety related to changes in lifestyle. The American College of Sports Medicine (ACSM) provides recommendations to maintain the levels of physical activity associated with the benefits of global health (ACSM 2020). A recently guidance published by WHO emphasizes these recommendations while encouraging people to focus on the precautions (WHO 2020).

In line with recent publications, and despite concerns with compliance with the main guidelines of SI, we described above some practical proposals to maintain or start the regular PE. One option is to start the exercise routine with the help of specific applications, using social media networks to provide information and practical indications of exercises to do at home. However, is important to leave some recommendations that can assist in this aspect: i) try to follow indications of qualified and accredited technician professionals. They know some training methods and principles in-depth and by applying them you can guarantee safe practice and suggest an exercise plan with options at different levels and adapting to these routines becomes easier; ii) starting or adapting a training routine to be done at home can be an excellent way to stay active. Home-based exercise is nothing new and seems to be an effective method in periods of SI; iii) performing exercises such as walking or running on the street or in the neighborhoods can help overcome the discomfort of trust.

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#### Author contributions

Rubens Vinícius Letieri and Guilherme Eustáquio Furtado carried out the intellectual conception, writing and preparation of the entire letter.

