

# Physical Activity And Reducing Sedentary Behavior During The Coronavirus Pandemic

Francisco José Gondim Pitanga,<sup>1</sup> Carmem Cristina Beck,<sup>2</sup> Cristiano Penas Seara Pitanga<sup>3</sup>

Universidade Federal da Bahia (UFBA),<sup>1</sup> Salvador, BA – Brazil

Instituto Federal de Santa Catarina,<sup>2</sup> Palhoça, SC – Brazil

Universidade Católica do Salvador,<sup>3</sup> Salvador, BA – Brazil

## Introduction

The novel coronavirus pandemic recently declared by the World Health Organization<sup>1</sup> has led several municipal and state health departments to issue decrees closing different spaces intended for practicing physical activity. Furthermore, the Ministry of Health<sup>2</sup> has prepared a manual with several initiatives to prevent the spread of the disease, in addition to making decisions suggesting social isolation and recommending that people remain at home. All of these measures have made it more difficult for the Brazilian population to practice physical activity.

On the other hand, the literature has consistently provided evidence regarding the diverse health benefits that physical activity promotes,<sup>3</sup> especially to the cardiovascular/metabolic<sup>4</sup> and immunological system.<sup>5</sup> More recently, the literature began to show evidence that health is related not only to regular practice of physical activity, but also to reduced sedentary behavior, in other words, time spent sitting, lying down, or reclining during the day, excluding sleep hours.<sup>6</sup>

Accordingly, there is an important need to continue practicing physical activity during the novel coronavirus pandemic; however, some measures should be observed in order to keep this practice safe. It is worth emphasizing that even in the city of Wuhan, China, the initial epicenter of the disease, it was recommended that people continue practicing physical activity inside their homes.<sup>7</sup> Furthermore, it has become important that the population be informed regarding the need to reduce sedentary behavior during this period of social isolation.

Thus, the objectives of this viewpoint are to emphasize the importance of these issues and to propose suggestions for continuing practice of physical activity and reducing sedentary behavior during the novel coronavirus pandemic in Brazil.

## Keywords

Pandemics; Coronavirus; Exercise; Physical Activity; Leisure Activities; Screen Time; Population Dynamics; Cardiovascular Physiological Phenomena

**Mailing Address:** Francisco José Gondim Pitanga •

Universidade Federal da Bahia (UFBA) - Av. Reitor Miguel Calmom, s/n.

Postal Code 40110-060, Salvador, BA – Brazil

E-mail: pitanga@lognet.com.br

Manuscript received March 24, 2020, revised manuscript April 08, 2020, accepted April 08, 2020

## The important of practicing physical activity and health benefits

### Physical activity and cardiovascular and metabolic health

The benefits of regular physical activity to cardiovascular/metabolic health have been widely published in the literature for a long time. Physical activity has been shown to be inversely associated with blood pressure levels, diabetes, lipid alterations, and other cardiovascular events.<sup>4,8</sup>

With respect to duration and intensity of physical activity required for these benefits to occur, a recent publication suggested that 180 to 300 minutes of moderate to intense activity weekly for men and 150 to 300 minutes of moderate to intense activity for women would be the most adequate measure for promoting cardiovascular and metabolic health benefits.<sup>9</sup> These recommendations are in agreement with the main physical activity guidelines published by international organizations.

### Physical activity and the immune system

The immune system is an important defense mechanism of the body. It is capable of recognizing and eliminating a series of invasive microorganisms. The first line of defense is made up of leukocytes (neutrophils, eosinophils, basophils, monocytes), which are natural killer cells, acute-phase proteins, and enzymes. The second line of defense is made up of T and B lymphocytes and immunoglobulins.<sup>5</sup>

Practice of physical exercise modulates the quantity of these substances in the organism, both increasing and decreasing, and the magnitude depends on the intensity and duration of physical activity.

In relation to leukocytes, for example, during practice of physical activity, their concentration increases, and it is immediately reduced following physical practice, especially after exercise with long duration and high intensity that may lead to immunosuppression, according to the theory of the “open window,” when there is a depression in the immune system after strenuous exercise, leaving the organism more susceptible to bacteria for a period of 3 to 72 hours. It is worth stressing that the period of immunosuppression is much shorter after light to moderate exercise without prolonged duration.<sup>5</sup>

### The importance of reducing sedentary behavior and cardiometabolic health

Sedentary behavior is defined as activities characterized by low energy expenditure, not exceeding 1.5 metabolic

equivalents, including the specific behaviors of sitting, reclining, or lying down to read, study, watch television, use the computer, etc., excluding sleep hours.<sup>6</sup>

A recent publication has demonstrated that reduced sedentary behavior is associated with beneficial effects on diverse variables that represent cardiometabolic health in adults.<sup>10</sup> In this same study, the authors also demonstrated that, when the reduction in sedentary behavior was associated with regular practice of physical activity, the benefits were maximized.

### Suggestions for continuing practice of physical activity during the novel coronavirus pandemic

#### Places for practicing physical activity

Considering that Brazil is a country of continental dimensions, it is important to accompany decisions published by state or municipal health departments and by the Ministry of Health regarding restricted access to gyms, clubs, clinics, and other spaces intended for practicing physical activity and exercise.

In the event that these spaces are closed to the public, physical activity should, whenever possible, continue in open-air environments. In this case, people should prioritize individual activities, always taking care to avoid crowds or even small groups of people. If these conditions are restricted, physical activity should be continued at home, preferably with the assistance of technology, such as exercise videos, applications, or professional guidance online.

#### Types of Physical Activity/Exercise

When it is possible to practice physical activity outdoors, aerobic activities are recommended, especially individual activities; crowds should be avoided. At this moment, it is necessary to avoid practicing group sports, even in small groups.

In the event that it is necessary to exercise at home, muscle-strengthening exercises (squats, push-ups, sit-ups, and others), stretches, balancing exercises, and climbing up and down stairs are recommended, preferably with the assistance of technology, such as exercise videos, applications, and professional guidance online. It is, furthermore, worth emphasizing the importance of increased domestic physical activity, i.e., general housework, such as washing dishes, washing and ironing clothes, and similar activities.

#### Intensity of Physical Activity

During the coronavirus pandemic in Brazil, it is recommended that the intensity of physical exercise be light to moderate, given that very high intensity may lead to more accentuated immunosuppression, requiring longer recovery time.

#### Duration of Physical Activity

During the coronavirus pandemic in Brazil, it is recommended that the duration of each exercise session be approximately 30 to 60 minutes daily. It is suggested that total time not be too long due to the immune system depression with longer recovery time.

#### Suggestions for reducing sedentary behavior during the novel coronavirus pandemic

Considering that, in addition to regular practice of physical activity, it is very important to reduce sedentary behavior, the following are recommended:

1. Reduce sedentary behavior to a maximum of 6 to 8 cumulative hours daily.
2. Reduce to a maximum of 2 to 4 hours sitting in front of the screen daily.
3. Attempt to maximize the number of interruptions/pauses to sitting time, namely, for every hour spent sitting, stand up for at least 5 minutes.

#### Final considerations

Based on the studies consulted, the evidence confirms the importance of continuing to practice physical activities during the novel coronavirus pandemic, with light to moderate intensity and duration, preferably in outdoor environments or at home. In addition, it is also very important to emphasize reducing sedentary behavior, namely, time spent sitting, lying down, or reclining, excluding sleep hours, and time spent in front of the television, computer, and similar devices.

#### Author contributions

Conception and design of the research: Pitanga FJG; Writing of the manuscript and Critical revision of the manuscript for intellectual content: Pitanga FJG, Beck CC, Pitanga CPS.

#### Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

#### Sources of Funding

There were no external funding sources for this study.

#### Study Association

This study is not associated with any thesis or dissertation work.

#### Ethics approval and consent to participate

This article does not contain any studies with human participants or animals performed by any of the authors.

### References

1. World Health Organization. (WHO). Novel Coronavirus (2019-nCoV): Situation Report-19. [Cited in 2020 Mar 23]. Available at: [https://www.who.int/docs/default-source/coronavirus/situation-reports/20200208-sitrep-19-ncov.pdf?sfvrsn=6e091ce6\\_2](https://www.who.int/docs/default-source/coronavirus/situation-reports/20200208-sitrep-19-ncov.pdf?sfvrsn=6e091ce6_2)
2. Brasil.Ministério da Saúde do Brasil. O que você precisa saber o Corona Vírus. [Citado em 16/03/2020] Disponível em: <https://coronavirus.saude.gov.br/>
3. Blair SN, Kohl HW, Gordon NF, Paffenbarger RS Jr. How much physical activity is good for health? *Ann Rev Publ Health.* 1992; 13: 99-126.
4. Lin X, Alvim SM, Simoes EJ, Bensenor I, Barreto S, Schimidt M, et al. Leisure time physical activity and cardio-metabolic health: results from the Brazilian Longitudinal Study of Adult Health (ELSA-Brasil). *J Am Heart Assoc.* 2016; 5(6):003337.
5. Krinski K, Elsagedy H, Colombo H, Buzzachara C, Soares I, CamposW, et al. Efeitos do exercício físico no sistema imunológico. *Rev Bras Med.* Jul 2010;67(7).
6. Tremblay MS, Aubert S, Barnes JD, Saunders T, Carson V, Latimer-Cheung AE, et al. Sedentary Behavior Research Network (SBRN)—terminology consensus project process and outcome. *Int J Behav Nutr Phys.* 2017;14(1):75.
7. Chen P, Mao L, Nassis GP, Harmer P, Ainsworth BE, Li F. Wuhan coronavirus (2019-nCoV): The need to maintain regular physical activity while taking precautions. *J Sport Health Sci.* 2020;9(2):103–4.
8. Pitanga FJG, Matos SMA, Almeida MDC, Barreto SM, Aquino EML. Leisure-Time Physical Activity, but not Commuting Physical Activity, is Associated with Cardiovascular Risk among ELSA-Brasil Participants. *Arq Bras Cardiol.* 2018;110(1):36-43.
9. Pitanga FJG, Pitanga CPS Beck CC. Physical Activity for the Prevention of Cardiometabolic Diseases: how much is Required? *Curr Res Diabetes & Obes J.* 2019; 9(4):
10. Pitanga FJG, Matos SMA, Almeida MDCC, Patrão AL, Molina MDDB, Aquino EM. Association between leisure-time physical activity and sedentary behavior with cardiometabolic health in the ELSA-Brasil participants. *SAGE Open Med.* 2019;7:1-9.



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