

# General recommendations for health care and physical activity vs. COVID-19 pandemic

Vancini, R., Lima Leopoldo, A. P., Carleti, L., Guimarães-Ferreira, L., Leopoldo, A., Leite, R., Rinaldi, N., Cunha, M. & Bocalini, D.

Published PDF deposited in Coventry University's Repository

## Original citation:

Vancini, R, Lima Leopoldo, AP, Carleti, L, Guimarães-Ferreira, L, Leopoldo, A, Leite, R, Rinaldi, N, Cunha, M & Bocalini, D 2021, 'General recommendations for health care and physical activity vs. COVID-19 pandemic', *Brazilian Journal of Exercise Physiology*, vol. 20, no. 1, pp. 3-16.

<https://dx.doi.org/10.33233/rbfex.v20i1.4144>

DOI 10.33233/rbfex.v20i1.4144

ESSN 1677-8510

Publisher: RBFEx

This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

## General recommendations for health care and physical activity vs. COVID-19 pandemic

### Recomendações gerais de cuidado à saúde e de prática de atividade física vs. pandemia da COVID-19

Rodrigo Luiz Vancini<sup>1</sup>, Ana Paula Lima Leopoldo<sup>1</sup>, Luciana Carletti<sup>1</sup>, Lucas Guimarães-Ferreira<sup>1</sup>, André Soares Leopoldo<sup>1</sup>, Richard Diego Leite<sup>1</sup>, Natália Madalena Rinaldi<sup>1</sup>, Márcia Regina Holanda da Cunha<sup>1</sup>, Danilo Sales Bocalini<sup>1</sup>

1. Universidade Federal do Espírito Santo, Vitória, ES, Brazil

#### ABSTRACT

The Center for Research and Extension in Body Movement Sciences (NUPEM) of CEFD/UFES, represented by professors and researchers, jointly prepared an open letter to the community. The group saw the importance of publishing management and strategies for maintaining physical activity and health care and prevention during the coronavirus pandemic (COVID-19). The pandemic has alarmed the sports community and physical activity practitioners for its potential for transmission, dissemination, hospitalization, and lethality, especially in more vulnerable populations, such as those with chronic diseases and the elderly. In addition to general information about the pandemic caused by COVID-19, the purpose of this document is to provide information and recommendations related to the practice of physical activity (PA) for the clarification of health professionals and people related to sport and PA. Thus, we intend to assist in education and health promotion through prevention strategies related to the pandemic and the practice of PA. In this perspective, according to current guidelines, it is recommended to avoid physical downtime and sedentary behaviors as much as possible. Still, it is recommended to practice 150-300 min/week of moderate intensity aerobic PA and 2 sessions of activities involving muscle strength training, contributing to the maintenance of health status. However, a lower volume of PA also produces health benefits, that is, performing some PA is better than none and moving more and resting less as well.

**Keywords:** viral disease; coronavirus; sport; physical activity; prevention.

#### RESUMO

O Núcleo de Pesquisa e Extensão em Ciências do Movimento Corporal (NUPEM) do CEFD/UFES, representado por professores e pesquisadores elaborou conjuntamente uma carta aberta à comunidade. O grupo vislumbrou a importância de publicar estratégias de gerenciamento e manejo para a manutenção da atividade física e de cuidados de saúde e prevenção durante a pandemia do coronavírus (COVID-19). A pandemia tem alarmado a comunidade esportiva e praticantes de atividade física por seu potencial de transmissão, disseminação, hospitalização e letalidade, principalmente em populações mais vulneráveis, como aquelas com doenças crônicas e idosos. Além de informações gerais sobre a pandemia causada pelo COVID-19, o objetivo deste documento é fornecer informações e recomendações relacionadas à prática de atividade física (AF) para o esclarecimento de profissionais de saúde e pessoas ligadas ao esporte e da AF. Pretendemos assim auxiliar na educação e promoção da saúde por meio de estratégias de prevenção relacionadas à pandemia e à prática de atividade física. Nesta perspectiva, de acordo com as diretrizes atuais, recomenda-se evitar ao máximo o tempo de inatividade física e comportamentos sedentários. Ainda, é recomendada a prática de 150-300 min/semana de AF aeróbica de intensidade moderada e 2 sessões de atividades que envolvam treinamento de força muscular, contribuindo com a manutenção do estado de saúde. No entanto, um volume menor de AF produz também benefícios à saúde, ou seja, realizar alguma AF é melhor que nenhuma e movimentar mais e repousar menos também.

**Palavras-chave:** doença viral; coronavírus; esporte; atividade física; prevenção.

Received on: May 20, 2020; Accepted on: Mai 30, 2020.

Correspondence: Núcleo de Pesquisa e Extensão em Ciências do Movimento Corporal (NUPEM), Centro de Educação Física e Desportos (CEFD), Universidade Federal do Espírito Santo (UFES), Campus Universitário, Av. Fernando Ferrari, 514; 29075810 Goiabeiras, Vitória ES. nupem.cefd.ufes@hotmail.com

## Introduction

### Key points

- COVID-19 is a major problem for public health systems and has a high potential for dissemination in sports/physical activity facilities, as these are often crowded environments.
- The current pandemic has frightened the sports and physical activity community (health professionals, technicians, spectators, practitioners, etc). This caused a chain reaction, with cancellations of competitions and sporting events and closure of sports and physical activity facilities worldwide.
- We must develop strategies to prevent COVID-19 infection among athletes, hobbyists, and health professionals, as well as to manage practice in a safe environment.
- The general recommendation by different health authorities, following the guidelines of the World Health Organization (WHO), so far, has been to wash and sanitize the hands, use disinfectants (with 70% alcohol), avoid public environments and agglomerations, and social distancing. This includes the entire community, that is, both spectators and practitioners.

### Problemization

According to the World Health Organization (WHO) [1], viral diseases pose a serious problem for local and global public health systems, as they have a high potential to cause epidemics (regional) and pandemics (global) [1,2]. In this context, viral infections have high potential for dissemination in physical activity and sporting facilities (gyms, clubs, arenas, championships, and competitions) due to close contact between people and sharing of equipment [3].

The risk for viral infections, including that caused by COVID-19, may be elevated under the environment's conditions (agglomerations) and, mainly, in immunodepressed individuals with chronic diseases [4]. Thus, older adults are more vulnerable due to the presence of comorbidities, immunodepression, and low functional capacity. The immunosenescence includes lower responses to vaccination, lower ability to mediate anticancer responses, increased inflammation, tissue damage, and loss of control of persistent infections [5]. In fact, particularly for COVID-19, older adults are at the top of the mortality rate. According to the WHO [1], 95% of COVID-19 deaths occurred in individuals aged 60 or older. Furthermore, adults aged 80 or older account for 50% of all deaths. An alarming point of data indicates that eight out of ten deaths occur in individuals with at least one comorbidity, particularly those with cardiovascular disease, hypertension and diabetes, but also with several other underlying chronic conditions.

The COVID-19 pandemic has already caused thousands of deaths in Brazil and around the world and continues to alarm the sports community and PA practitioners for its potential for transmission, dissemination, hospitalization and lethality in the most vulnerable populations.

One of the most important conducts for the control of the pandemic, according to the most renowned public health entities in the world [1,6], is the adoption of social distance and avoiding crowds of people. Wilder-Smith and Freedman [7] point out that the terms distancing, isolation and quarantine are not synonymous. Within this context, social distancing is the minimization of interaction between people in a community to reduce the speed of transmission of the virus since there are asymptomatic infected individuals still unaware of the condition. In contrast, isolation is the measure that aims to separate individuals affected with COVID-19 (symptomatic, suspected or confirmed cases) from non-patients, avoiding the spread of the virus. Finally, quarantine means the separation of people, as well as the restriction of their activities, that were probably exposed to a contagious disease, but not yet present the symptoms, either because they have not been infected or because they are in the incubation period. The authorities' behaviors and decisions, however, vary according to the reality of each country, being updated dynamically [1,6]. The period of aggressive quarantine and social isolation was gradually being overcome with the implementation of safety and sanitary measures, such as, for example, respecting social distance and avoiding crowds, when leaving home, constant use of facial masks in internal and external environments, wash your hands with soap and water and use 70% alcohol frequently and avoid putting your hands in your mouth, nose and eyes.

By using data obtained during previous epidemic crises, the total time of social distancing or quarantine can be predicted, since the habits assumed during this period have an extremely negative impact on the physical and mental health of the population. For example, during the epidemic of severe acute respiratory syndrome (SARS) in 2004, it was observed that people who were quarantined in Toronto, Canada had a high prevalence of psychological problems. Data obtained through online form [8] indicated that 28.9% and 31.2% of these people had symptoms of post-traumatic stress disorder and depression, respectively. Recent data already indicate that the COVID-19 pandemic is also associated with many negative psychological consequences such as depression and anxiety disorders [9]. Furthermore, in addition to the negative consequences on the general state of health during the pandemic, we must also consider the economic consequences and their future impacts.

## **Epidemiological aspects and the context of physical activity and sport**

The disease caused by betacoronavirus, COVID-19, is characterized by respiratory disorder resulting from infection and leading to SARS [10]. Initially it promotes a typical picture of cold and flu, involving signs and symptoms such as fever, muscle pain, nasal congestion, headache, malaise, dry cough, sputum and shortness of brea-

th, which are commonly mild, but may generally impair physical performance. In the most severe cases, it may progress to pneumonia and severe lower respiratory tract infection, which increases the risk of morbidity and mortality, leading to the need for mechanical ventilation and hospitalization in the Intensive Care Unit (ICU) [1,2,11].

In general, fatal and more severe cases are associated with older people. However, younger adults between 30 and 59 years have also become fatal victims of the disease, especially those with comorbidities. Approximately 50% of critical cases are people affected with cardiovascular diseases, diabetes, chronic respiratory diseases (asthma and chronic obstructive pulmonary disease (COPD)) and oncological diseases [2].

Although there is still no consensus, the main hypothesis is that the first cases of COVID-19 disease were related to direct exposure of humans in the Wuhan Seafood Wholesale Market in China [1,2]. Since then, facilitated by the large transit of people between countries, cases of COVID-19 infection have increased exponentially worldwide, turning into a pandemic. To prevent the spread and transmission of the virus on a large scale, measures to control public health infection, risk management and education and health promotion are required. Social and economic support is also needed, as well as investments in health and science. These actions should involve all civil society, state and federal governments, public and private institutions and non-governmental organizations, with the aim of containing the outbreak and spread of the disease [1,2,6].

The pandemic associated with COVID-19 [1,2,6] generated great concern in the international sporting community, including associations, institutions, federations and sports leagues due to the potential for transmission of the virus in its events, spaces and sports arenas. In this context, the American College of Sports Medicine [12] officially issued a position on COVID-19. The entity points out that:

“Personal trainers, exercise physiologists and fitness and wellness professionals should be aware of COVID-19 and seek information about conducts. Due to the frequency and physical proximity with which you interact with your customers and athletes, as well as potentially infected surfaces and materials, it is necessary to change the conduct of physical activity practice indoors and outdoors for you and your customers to remain safe” [12].

A letter written by scientists toward the public, published on March 17, 2020 in the British Journal of Sports Medicine [13] contained the following guidelines:

“If possible, exercise outdoors! You might want to jog in rural areas if those are available. And if you live in a city where there is no way to avoid contact with other people, try doing a workout at home. It is important to maintain a healthy lifestyle with regular exercise, which will benefit your immune system” [13].

Regarding this letter [13], “exercising outdoors” might take some deliberation, as it can increase the risk of infection by the virus.

The theme of COVID-19 has gained prominence in the scientific community, including the sports and physical activity community. For example, Jiménez-Pavón et al.[14] in a recently published article, highlight the need to reduce the negative consequences of diseases that can be amplified with social distancing and physical inactivity, such as diabetes, hypertension, cardiovascular and respiratory diseases, and also the changes inherent to aging, such as sarcopenia, dementia and psychological effects. They also encourage the practice of physical exercises, even if it is not possible to meet the minimum proposed in the prescription guidelines [14].

Considering this change in everyday life worldwide as a result of COVID-19, Hall et al. [15] suggest that this health crisis has a relevant impact on the pandemic of physical inactivity and sedentary behavior, since we have not resolved this issue for several years. The authors also question whether the pandemic is making the world's population move less, and the answer to that question is yes. It is noteworthy that there is no literature that evaluated the lasting effect of pandemics on physical practice and sedentary behavior.

Another relevant aspect is that positive efforts to keep the individual physically active should continue during the COVID-19 pandemic, however researchers highlight the concern with individuals who have not previously been involved in a regular exercise routine and have a sedentary lifestyle. The study [15] suggests that they are unlikely to increase their daily physical activity during the pandemic and, in fact, may be moving less than before. This situation can generate a cycle in which current patterns of physical inactivity as well as sedentary behavior can worsen the impact of future pandemics [15].

## What to do?

From the perspective of public health management, the main concern has been with the acceleration of COVID-19 transmission. This is because it has the potential to collapse the health system, so that people could die due to the impossibility of medical intervention, including other diseases or traumas. This has happened around the world. In this sense, the collective effort to stop this propagation is fundamental.

Places with circulation of many people such as airports, shopping malls, gymnasiums and educational institutions (such as Universities and Schools), as well as cultural and sporting events held mainly indoors (and involving health professionals and practitioners) have high transmission potential, due to crowding and close contact between people.

Given the proportion and effects (number of infected, hospitalizations and deaths) of the current pandemic, the recommendations for social distancing have been radical. In principle, during the first wave of transmission of the virus, the recommendation has been adopted to leave home only when extremely necessary [1]. However, the information and guidelines are updated daily. Therefore, it is important

to frequently monitor the positioning of respected entities, that is, those that have a scientific advisory body. In addition, it is important to emphasize that the distancing effort may postpone the peak of the pandemic to autumn, with consequent increase in transmissibility in the winter [16].

#### *Precautionary and hygiene measures*

There are essential measures for infection prevention and control that should be implemented by all professionals working in community services avoiding or even reducing the transmission of microorganisms, mainly because there are still no vaccines or antiviral drugs specific to the treatment of COVID-19 [1,2]. Therefore, it is necessary for our community to be guided towards precautionary measures and safe use of personal protective equipment, in order to prevent the spread of the disease, in addition to preventing the transmission of the virus in infected people, with or without symptoms.

As for dissemination, it is known, to date, that the new coronavirus is transmitted through droplets that are expelled during speech, coughs or sneezes, direct contact with infected people or even by indirect contact through the hands. In addition, contact with contaminated objects or surfaces can then generate contact with the mouth, nose or eyes, in a very similar way to the spread that occurs in other diseases transmitted by the airway (influenza, diphtheria, tuberculosis). In this sense, both PAHO and WHO [1] as well as other organizations issued the following general prevention recommendations:

a) Wash your hands using soap and water or alcohol-based sanitizer (70%), frequently, especially after contact with infected people or the environment to eliminate microorganisms that may be in your hands; repeat this act before coming into contact with the mucous regions of the body, such as the mouth, eyes and nose;

b) Make sure that you and the people around you follow good respiratory hygiene. This means covering the mouth and nose with the inner part of the elbow or with a tissue when coughing or sneezing (then discard the used handkerchief immediately) and washing your hands afterwards. When someone coughs or sneezes, liquid droplets are sprayed from the nose and/or mouth, possibly containing the virus.

c) When leaving home, keep at least an one-meter distance between you and anyone else; people with symptoms of acute airway infection should keep away from other people and redouble care with hand washing in addition to using masks, to prevent the spread of viral particles;

d) The use of disposable surgical masks is indicated for people with respiratory symptoms (cough or difficulty breathing), as well as for health professionals who provide care to individuals with respiratory symptoms. Regarding surgical masks, proper use and disposal are essential to ensure its effectiveness and avoid increased risk of transmission associated with incorrect practices.

e) Stay at home if you have a fever (temperature above 37.5°C); if you have a cough and difficulty breathing, seek medical attention.

f) Travelers returning from affected areas should monitor their symptoms for 14 days and follow the national protocols of the receiving countries; and if symptoms occur, they should contact a doctor and report on their travel history and symptoms.

- g) Avoid unprotected contact with farm animals or wild animals.
- h) There is no evidence that domestic animals can transmit the disease to humans, but it is recommended to isolate them when contamination is suspected or avoid contact with the animal when the owner is contaminated.
- i) Current evidence suggests that the new coronavirus may remain viable for hours and even days on certain surfaces, depending on the type of material. Therefore, the cleaning of objects and surfaces, followed by disinfection, are recommended measures for the prevention of COVID-19 and other viral respiratory diseases in community environments.

According to technical note 34/2020 of ANVISA [17], for the disinfection of external environments, it is correct to use alcohol 70% in addition to products based on sodium or calcium hypochlorite, at a concentration of 0.5%. Commercial bleach has a sodium hypochlorite concentration between 2.0 and 2.5% and is a toxic product in contact with eyes or skin. It is interesting to note that this chemical is unstable after dilution and can be deactivated by light, so care is recommended in its handling and immediate use after dilution. It should not be mixed with other products, as sodium hypochlorite can react violently with many chemical substances, producing toxic compounds or even losing its effectiveness as a disinfectant [17,18].

## What can physical activity and exercise do for people?

Although the association between physical inactivity and mortality be a consensus recognized worldwide, according to recent data 31% of individuals aged 15 years or older are physically inactive and approximately 3.2 million deaths per year are attributed to this harmful behavior to the lifestyle and the practice of physical activity in leisure time could change this scenario [19]. Although social distancing in a specific context of viral pandemic is temporary, we understand that it is important to raise awareness about physical inactivity and sedentary behavior. In this sense, there is evidence that links high risk of chronic diseases when the individual is physically inactive, with consequent sedentary lifestyle [20-22].

Although there is no direct evidence, there is an assumption that people who exercise regularly may be less vulnerable to viral diseases, since non-communicable diseases (obesity, hypertension, diabetes, etc.) and risk factors associated with lifestyle (physical inactivity and smoking) are less prevalent in physical practitioners. Furthermore, generalized physical exercise for the older population promotes improvements in physical function, as well as in the cognitive aspects [23,24].

Systematic physical practice can complement therapy for a variety of chronic diseases, including cardiovascular diseases, neurological and psychiatric disorders, metabolic syndrome, oncological and respiratory diseases [25]. In addition, there is a lot of scientific evidence available indicating that the practice of regular physical exercise, mainly of moderate intensity, has a positive effect on immunity [26-29]. It is also worth mentioning in this context that older people apparently benefit more than young people in relation to protection against all-cause mortality and some



diseases [30-32], although we do not have evidence in relation to COVID-19. Mazioli et al. [33] demonstrated that in addition to presenting better immune response, mice submitted to regular physical exercise (30 min/day) with moderate intensity had a lower mortality rate after infection with influenza virus. However, long-term physical exercise (approximately 2.5h/day) resulted in more severe symptoms, with no influence on mortality when compared to sedentary animals. The same researchers found that in humans, moderate physical activity prolongs the protective effect of annual vaccination against influenza virus. However, no studies have yet been found with COVID-19 to confirm the transposition of these results.

Although there is still no research on COVID-19, in other respiratory tract disorders (e.g., asthma and COPD) the practice of moderate physical exercise has a positive impact on immunity, besides being associated with the adoption of other positive life habits, such as adequate sleep, reduced alcohol intake, smoking cessation and adequate nutrition and hydration [26,27,29]. In addition, the current literature shows that moderate physical activity improves the function of defense cells, reducing the risk of infectious diseases as well as increasing stress hormones with consequent reduction of excessive inflammation [34]. Thus, individuals who perform moderate levels of physical activity in their daily life have a 20-30% reduction in upper respiratory tract infections. However, prolonged high-intensity physical activity can lead to impaired immune system, leading to increased susceptibility to infections [34-36].

### *General recommendations for the practice of physical activity during the COVID-19 pandemic*

Given the difficulty of individualizing the orientation of physical activity at the moment, the general and conservative recommendation of physical practice may be those presented by the WHO [1], the American College of Sports Medicine (ACSM) [12] and the Brazilian Society of Sports Medicine (SBME) [36,37]. Figure 1 summarizes the main actions to be taken during the pandemic.

These documents recommend 150-300 min per week of aerobic exercise (e.g., walking indoors and stationary cycling) of moderate intensity and two sessions of activities involving muscle strength training. In addition, they recommend avoiding physical downtime and sedentary behaviors such as sitting, using a mobile device or watching TV for a long time.

The guidance for moderate PA is based on the fact that this type of modality improves / preserves the general health status, including the improvement of immunity, and the reduction of anxiety and emotional stress, very common in the condition of social distance and isolation. Thus, domestic programs using safe, simple and easily implementable exercises are suitable to preserve fitness levels, including aerobic exercises (walking indoors), strengthening, stretching and balancing, or combinations of these [38,39]. On the other hand, intense physical exercise can be harmful to health depending on the profile of the practitioner and the level of

intensity [39-40].

With the closure of gyms and clubs, individuals involved in strength training programs were unable to access a wide variety of equipment, dumbbells and weights. In the home environment, access to equipment and a variety of weights is restricted to most of the population. Thus, the use of smaller loads, using dumbbells, elastic bands and the weight of the body itself, for example, become valid alternatives. Kikuchi and Nakazato [40] demonstrated that a training program using exercise with the weight of one's own body (push-ups) with a load proportional to 40% of 1RM resulted in a significant increase in strength.

Therefore, it is recommended that during the period of social distancing, individuals adapt their strength training programs using low-cost equipment such as furniture and household items as well as the weight of the body itself [14].

Considering the declarations of health agencies, so far, we can highlight the following practical guidelines [1,6]:

- The regular practice of physical exercise/physical activity is associated with improved immune function in humans, optimizing the body in the fight against infectious agents. Although there is no evidence of this improvement with the fight against COVID-19, an optimized immune system could fight infectious agents.
- Physically active individuals have lower risk in the development of chronic non-communicable diseases.
- Older adults, at higher risk, should be encouraged to maintain active habits, especially in an adapted fashion considering the place of practice, as well as social relations.
- The recommendations of the WHO and the Brazilian Ministry of Health point out that people should avoid staying indoors with large amount of people, especially in gyms, sports clubs and the like.
- The possibility of outdoor physical activity should consider guidelines from the Ministry of Health and municipal, state and federal governments, given the risk of contamination among people; and the minimum social distancing, according to the modality practiced. According to the WHO, in the case of cycling or walking outdoors, always practice physical distance and wash your hands with soap and water before leaving, when you get to where you are going and as soon as you get home. If soap and water are not available immediately, alcohol-based cleaning products are recommended.
- There are no recommendations now regarding limitation of physical activity if you are asymptomatic, however, do not exercise if you have fever, cough and difficulty breathing. Stay at home and rest and seek medical attention. Follow the instructions of your local health authority.
- Everyone should be careful with exercises of high intensity and volume, it can impair the immune system, especially of individuals not yet accustomed.
- Engage in activities in which children and the family, who are living in the same environment of social distancing, can participate simultaneously.
- If you are not regularly active, start with low intensity activities such as walking and low-impact exercises. Start with amounts of short exercises, such as 5 to 10 minutes, and gradually increase up to 30 minutes or more during

the weeks. It is better and safer to stay active for short periods more often than trying to stay active for long periods when you are not adapted.

- Sports activities such as interactive video games (EXERGAMES – dance games, for example) and walking in the home environment are recommended.

- It is noteworthy that quarantined individuals (with a positive diagnosis for the disease) should remain in complete isolation to avoid the spread of the virus. This disease still has unknown repercussions that can lead to the development of cardiac and pulmonary complications; as such, individuals presenting symptoms should refrain from physical activity until complete recovery.

- It is important to raise awareness not only of hygiene, but of all parameters of self-care.

- Try to reduce your sitting, lying or motionless time, i.e. sedentary habits. Take advantage of the architecture (e.g. stairs) and furniture of the residence as tools to assist physical activity.

## Are we going to move during the pandemic and social distance?

*Use your free time to move around, avoiding sedentary behaviors.*

*Some specific strategies:*

1. Perform indoor activities (work and domestic) while listening to music. Take the opportunity to experience dances in general, climb stairs frequently, (two to three times daily, 10 to 15 minutes), skip rope - as long as you have no osteomyoarticular and/or cardiac problems. In these cases, appropriate recommendation and medical follow-up are necessary.
2. Watch interactive videos on social networks; but remember, consider their functional limitations, as well as the intensity recommended by institutions with scientific support. In this sense, try to interact with materials that are guided by health professionals and entities. Consult before choosing for more safety.
3. If you have equipment such as treadmills and stationary bikes it is a great opportunity to use them.
4. Muscle strength activities using dumbbells, free weights, elastic bands or the body weight itself are good options. But be prudent and be careful. Pay attention to the correct posture and technique during the execution of the movements.
5. Consider activities renowned for reducing anxiety and depression (alternative therapies) such as meditation, yoga, tai chi and lian gong.
6. The recommendation of outdoors practices such as walking, running and biking is still relevant for the better functioning of the immune system and general health. However, current recommendations are to avoid indoor activities (gyms) and take care in the practice of outdoor activities (walking and running in outdoor environments should respect the social distance) to prevent local and community transmission of the virus and not to overload local health systems;
7. Pay attention to the situation in your city, as in some places there are local rules for all citizens and rules regarding the use of indoor and outdoor environments;
8. Additionally, we recommend gardening in general; in rural areas or even in the urban environment, if possible, stimulated mainly among the older population.
9. Household chores are welcome to increase energy expenditure (laundry, sweeping the house etc.).
10. If you have difficulty performing the activities yourself, seek health professionals.
11. If you want to develop a specific physical exercise program, contact a Physical Education

professional. It is worth noting that the Federal Council of Physical Education allows Physical Education teachers to work through an online consulting service. This can represent a great opportunity for accompaniment by a trained professional, even during the period of social distance and isolation and in the impossibility of crowds of people as it happens in gyms. However, PA practice sites have instituted safety measures (distance of at least 1 meter between practitioners) and sanitary measures (use of face masks and 70% alcohol) in order to make the use of spaces safer.

In this context, there are national and international scientific approaches and reflections on the recommendations of physical exercise in the domestic environment during the period of social distancing. The guidelines aim to improve adherence and maintenance of physical exercise programs and to contribute to the promotion of health during the COVID-19 pandemic and the necessary measures of social distance and avoiding crowds. Jiménez-Pavón et al. [14] point out that if possible, considering the reduction in the level of physical activity caused by social distancing, the weekly volume of physical exercise should be raised to about 200 to 400 min, 5 to 7 days a week. In addition, Oliveira Neto et al. [41] suggested a model of prescription of physical exercise in a domestic environment of strength exercises (strength training program based on calisthenics) for the main muscle groups. The authors also guide the use of tools that allow monitoring the quantity and quality of physical exertion (subjective effort perception scale), as well as personal satisfaction (scale of sensation and motivation for practice).

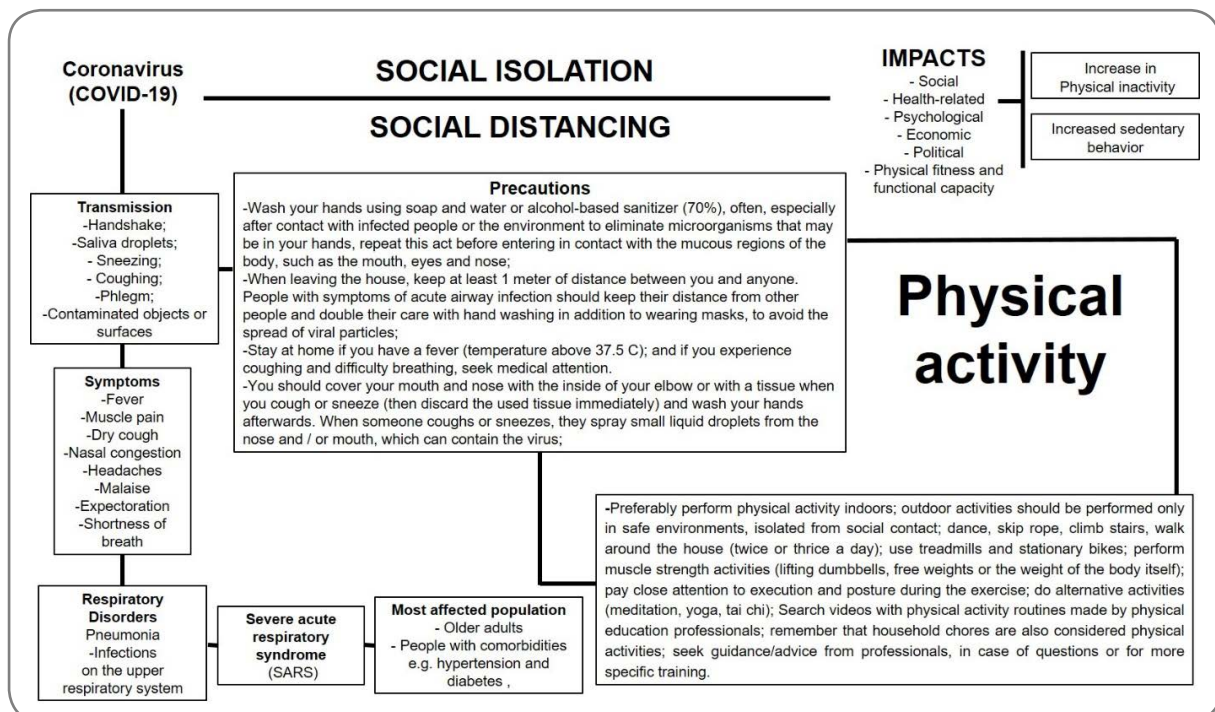


Figure 1 - General recommendations for healthcare and physical activity

## Conclusion

Taking into account the current scenario, the best strategy to reduce community transmission during the COVID-19 pandemic still continues to respect social distancing and sanitary measures (wearing face masks, washing hands and hygiene with alcohol 70% frequently). With the process of social, economic and technological globalization; diseases have also become global. Thus, health and education systems need to be strengthened as a whole.

Thus, promotion of prevention strategies and dissemination of accurate information are necessary to prevent infection by the disease among athletes, physical activity practitioners, health professionals and other people involved in the context. It is important to stimulate physical activity as well as the reduction of sedentary behavior during this delicate period. The guidelines for the practice of physical exercises should be available to the population, while respecting the guidelines of social distancing.

This article brought some practical recommendations, supported by scientific evidence and aiming at health promotion and attenuation of injuries associated with sedentary behavior. It is also necessary to reinforce that the general hygiene recommendation involves: washing hands with soap and water frequently; using hand sanitizer (alcohol 70%); avoiding hand-to-face contact after interacting with a potentially contaminated environment; respecting the minimum distance of 2m when in establishments classified as essential, including supermarkets and pharmacies. Therefore, it is time to stay alert and follow the guidelines of public and health authorities.

### Acknowledgment

The authors RLV, NMR, DSB thank CNPq and FAPES for their support. To all health professionals and scientists who donate their knowledge and experience to save lives.

### Conflict of interest

The authors declare no conflict of interest.

### Funding

National Council for Scientific and Technological Development (CNPq) and Espírito Santo Research and Innovation Support Foundation (FAPES).

### Authorial contribution

All authors participated equally in the writing, analysis and publication of the document.

## References

1. World Health Organization (WHO). Coronavirus disease (COVID-2019) situation reports. [citado 2020 Mar 17]. Disponível: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>.
2. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R. Features, evaluation and treatment coronavirus (COVID-19). Book chapter. [citado 2020 Mar 19]. Disponível: <https://www.ncbi.nlm.nih.gov/books/NBK554776/>
3. Halabchi F, Ahmadinejad Z, Selk-Ghaffari M. COVID-19 Epidemic: exercise or not to exercise; that is the question! *Asian J Sports Med* 2020;11(1):e102630.

4. Al-Hazmi A. Challenges presented by MERS corona virus, and SARS corona virus to global health. *Saudi J Biol Sci* 2016;23: 507-11. <https://doi.org/10.1016/j.sjbs.2016.02.019>
5. Pawelec G. Age and immunity: What is “immunosenescence”? *Exp Gerontol* 2018;105:4-9. <https://doi.org/10.1016/j.exger.2017.10.024>
6. Center for Disease Control and Prevention (CDC). How to protect yourself. [citado 2020 Mar 18]. Disponível: <https://www.cdc.gov/coronavirus/2019-ncov/prepare/prevention.html>.
7. Wilder-Smith A, Freedman DO. Isolation, quarantine, social distancing and community containment: pivotal role for old-style public health measures in the novel coronavirus (2019-nCoV) outbreak. *J Travel Med* 2020;27(2). <https://doi.org/10.1093/jtm/taaa020>
8. Hawryluck L, Gold WL, Robinson S, Pogorski S, Galea S, Styrá R. SARS control and psychological effects of quarantine, Toronto, Canada. *Emerg Infect Dis* 2004;10(7):1206-12.
9. Li S, Wang Y, Xue J, Zhao N, Zhu T. The impact of COVID-19 epidemic declaration on psychological consequences: a study on active weibo users. *Int J Environ Res Public Health* 2020;17:E2032
10. Sohrabi C, Alsafib Z, O’Neill Z, Kerwan KA, Iosifidis AAC, Aghad R. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). *Int J Surg* 2020;76:71-6. <https://doi.org/10.1016/j.ijsu.2020.02.034>
11. Van den Brand JM, Smits SL, Haagmans BL. Pathogenesis of Middle East respiratory syndrome coronavirus. *J Pathol* 2015;235:175-84. <https://doi.org/10.1002/path.4458>
12. American College of Sports Medicine (ACSM). Personal Trainers, Fitness Professionals and the Coronavirus (COVID-19). [citado 2020 Mar 20]. Disponível: <https://www.acsm.org/read-research/newsroom/news-releases/news-detail/2020/03/09/personal-trainers-fitness-professionals-and-the-coronavirus-COVID-19>
13. British Journal of Sports Medicine (BJSM). Exercise and Infectious Diseases Covid-19. [citado 2020 Marc 21]. Disponível: <https://blogs.bmj.com/bjbm/2020/03/17/exercise-and-infectious-diseases-covid-19/>
14. Jiménez-Pavón D, Carbonell-Baeza A, Lavie CJ. Physical exercise as therapy to fight against the mental and physical consequences of COVID-19 quarantine: Special focus in older people. *Prog Cardiovasc Dis* 2020;63(3):386-88. <https://doi.org/10.1016/j.pcad.2020.03.009>
15. Hall G, Laddu DR, Phillips SA, Lavie CJ, Arena R. A tale of two pandemics: How will COVID-19 and global trends in physical inactivity and sedentary behavior affect one another? *Prog Cardiovasc Dis* 2020; S0033-0620:30077-3. <https://doi.org/10.1016/j.pcad.2020.04.005>
16. Kissler S, Tedijano C, Lipsitch M, Grad Y. Social distancing strategies for curbing the COVID-19 epidemic. 2020. <http://dash.harvard.edu/handle/1/42638988>
17. Nota técnica Nº 34/2020 SEI/COSAN/GHCOS/DIRE3/ANVISA
18. Nota técnica Nº 04/2020 GVIMS/GGTES/ANVISA
19. Lee DC, Pate RR, Lavie CJ, Sui X, Church TS, Blair SN. Leisure-time running reduces all-cause and cardiovascular mortality risk. *J Am Coll Cardiol*. 2014;64(5):472-81.
20. Wen CP, Wu X. Stressing harms of physical inactivity to promote exercise. *Lancet* 2012;380(9838):192-3. [https://doi.org/10.1016/S0140-6736\(12\)60954-4](https://doi.org/10.1016/S0140-6736(12)60954-4).
21. Pratt M, Ramirez Varela A, Salvo D, Kohl III HW, Ding D. Attacking the pandemic of physical inactivity: what is holding us back? *British J Sport Med* 2019. <https://doi.org/10.1136/bjsports-2019-101392>
22. Bauer UE, Briss PA, Goodman RA, Bowman BA. Prevention of chronic disease in the 21st century: elimination of the leading preventable causes of premature death and disability in the USA. *Lancet (London, England)* 2014;384(9937):45-52. [https://doi.org/10.1016/S0140-6736\(14\)60648-6](https://doi.org/10.1016/S0140-6736(14)60648-6)
23. Booth FW, Roberts CK, Thyfault JP, Ruegsegger GN, Toedebusch RG. Role of inactivity in chronic diseases: evolutionary insight and pathophysiological mechanisms. *Physiol Rev* 2017;97:1351-402. <https://doi.org/10.1152/physrev.00019.2016>
24. Lavie CJ, Ozemek C, Carbone S, Katzmarzyk PT, Blair SN. Sedentary behavior, exercise, and cardiovascular health. *Circulation Research* 2019;124(5):799-815. <https://doi.org/10.1161/CIRCRESAHA.118.312669>
25. Falck RS, Davis JC, Best JR, Crockett RA, Liu-Ambrose T. Impact of exercise training on physical and cognitive function among older adults: a systematic review and meta-analysis. *Neurobiol Aging* 2019;79:119-30. <https://doi.org/10.1016/j.neurobiolaging.2019.03.007>
26. Pedersen BK, Saltin B. Exercise as medicine - evidence for prescribing exercise as therapy in 26 different chronic diseases. *Scand J Med Sci Sports* 2015;25 Suppl 3:1-72. <https://doi.org/10.1111/sms.12581>
27. Simpson RJ, Kunz H, Agha N, Graff R. Exercise and the regulation of immune functions. *Prog Mol Biol Transl Sci* 2015;135:355-80. <https://doi.org/10.1016/bs.pmbts.2015.08.001>
28. Roberts JA. Viral illnesses and sports performance. *Sports Med* 1986;3:298-303. <https://doi.org/10.2165/00007256-198603040-00006>
29. Paffenbarger Junior RS, Hyde RT, Wing AL, Hsieh CC. Physical activity, all-cause mortality, and longevity of college alumni. *N Engl J Med* 1986;6(314):605-13. <https://doi.org/10.1056/NEJM198603063141003>
30. Löllgen H, Böckenhoff A, Knapp G. Physical activity and all-cause mortality: an updated meta-analysis with dif-

- ferent intensity categories. *Int J Sports Med* 2009;3:213-24. <https://doi.org/10.1055/s-0028-1128150>
31. Samitz G, Egger M, Zwahlen M. Domains of physical activity and all-cause mortality: systematic review and dose-response meta-analysis of cohort studies. *Int J Epidemiol* 2011;5:1382-400. <https://doi.org/10.1093/ije/dyr112>
32. Mazioli RCF, Santos JP, Silva VL, Lunz W, Perez AJ, Lima-Leopoldo AP, et al. Marcadores hematológicos de corredores amadores do município de Vitória/ES. *ConScientiae Saúde* 2015;14(3):394-401. <https://doi.org/10.5585/consaude.v14n3.5772>
33. Harris MD. Infectious disease in athletes. *Curr Sports Med Rep* 2011;10(2):84-9. <https://doi.org/10.1249/JSR.0b013e3182142381>
34. Ahmadinejad Z, Alijani N, Mansori S, Ziaee V. Common sports-related infections: a review on clinical pictures, management and time to return to sports. *Asian J Sports Med* 2014;5(1):1-9. <https://doi.org/10.5812/asjasm.34174>
35. Sociedade Brasileira de Medicina do Esporte. Informe da Sociedade Brasileira de Medicina do Exercício e do Esporte (SBMEE) sobre exercício físico e o coronavírus (COVID-19). [citado 2020 Mar 24]. [http://www.medicinado-esporte.org.br/wp-content/uploads/2020/03/sbmee\\_covid19\\_final.pdf](http://www.medicinado-esporte.org.br/wp-content/uploads/2020/03/sbmee_covid19_final.pdf)
36. Sociedade Brasileira de Medicina do Esporte. Informe 2 da Sociedade Brasileira de Medicina do Exercício e do Esporte (SBMEE) sobre exercício físico e o coronavírus (COVID-19). [citado 2020 mar 24]. [http://www.medicinado-esporte.org.br/wp-content/uploads/2020/03/sbmee\\_covid\\_informe2.pdf](http://www.medicinado-esporte.org.br/wp-content/uploads/2020/03/sbmee_covid_informe2.pdf)
37. 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.
38. Lavie CJ, O'Keefe JH, Sallis RE. Exercise and the heart - the harm of too little and too much. *Curr Sports Med Rep* 2015;14(2):104-9. <https://doi.org/10.1249/JSR.0000000000000134>
39. Schnohr P, O'Keefe JH, Marott JL, Lange P, Jensen GB. Dose of jogging and long-term mortality: the Copenhagen City Heart Study. *J Am Coll Cardiol* 2015;10(65):411-9. <https://doi.org/10.1016/j.jacc.2014.11.023>
40. Kikuchi N, Nakazato K. Low-load bench press and push-up induce similar muscle hypertrophy and strength gain. *Journal of Exercise Science and Fitness* 2017;15(1):37-42. <https://doi.org/10.1016/j.jesf.2017.06.003>
41. Oliveira Neto L, Elsangedy HM, Tavares VDO, Teixeira CVLS, Behm DG, Silva-Grigoletto ME. Training In Home - training at home during the COVID-19 (SARS-COV2) pandemic: physical exercise and behavior-based approach. *Rev Bras Fisiol Exerc* 2020; ahead print. <https://doi.org/http://dx.doi.org/10.33233/rbfe.v19i2.4006>