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COVID-19 risk comorbidities: Time to reappraise our physical inactivity habits (again!)

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Abstract

Infection and mortality rates of coronavirus disease 2019 (COVID-19) are astonishing. As of September 7, 2020, more than 27 million people around the world have already been infected, with more than 890 thousand deaths. Hypertension, diabetes, and obesity are among the most reported comorbidities associated with mortality by this disease. All these comorbidities are also strongly associated with physical inactivity and sedentary behavior. On the other hand, it is known that aerobic and resistive exercises are excellent tools to prevent and manage these comorbidities. Hence, physically active people may have a better prognosis if infected by COVID-19. Also, science tried to warn about mortality and morbidity associated to physical inactivity more than 80 years ago. However, physical inactivity habits are getting more prevalent around the world. Reasons for that include social, technology, and economic development that led to large industrialization and urbanization. Along with these changes, both professional and domestic activities became less active. Consequently, health care costs related to hypokinesia are estimated to increase exponentially in various regions of the planet. Now, while facing COVID-19 pandemic, it is time to reinforce the physiological, social, and economic relevance of regular physical exercise. Therefore, urgent reappraisal of our physical inactivity habits should be done, again!

Key Words: COVID-19; Physical inactivity; Sedentarism; Exercise; Health; Economy

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Core Tip: Millions of people have been infected by coronavirus disease 2019 (COVID-19) after its outbreak in December 2019 in China, and thousands of them have died

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around the world. These astonishing happenings forced the World Health Organization to declare a pandemic. Of note, older people and those with comorbidities such as hypertension and diabetes are at higher risk. Regular exercise is an excellent tool to manage all those comorbidities as well as to boost human immune system, preparing people to fight infections. However, people are getting more sedentary in the last decades! During COVID-19 pandemic, we must reappraise our inactivity habits to improve health and to minimize costs to public health systems.

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INTRODUCTION

Infection with severe acute respiratory syndrome coronavirus 2 results in coronavirus disease 2019 (COVID-19)^[1]. The outbreak of the disease occurred in China in December 2019. Infection and mortality rates of this pandemic around the world are astonishing. As of September 7, 2020, more than 27 million people around the world have already been infected, with more than 890 thousand deaths. United States, India, Brazil, and Russia are the most infected countries at this point with more than 1 million confirmed cases^[2].

Older individuals are at higher risk of poor clinical outcomes related to the disease^[1]. However, several other risk factors have been associated to COVID-19 severity. Of note, hypertension, diabetes, and obesity are among the most reported comorbidities associated to high mortality rates^[3,4]. For instance, Zhou *et al*^[1] found that hypertension (30% of patients) and diabetes (19% of patients) were the most common comorbidities in a sample of 191 patients from Wuhan. A nationwide study from China with more than 1500 patients confirmed those data showing that hypertension was the most prevalent comorbidity (17%), followed by diabetes (8%)^[5]. Finally, data from 5700 patients from the New York City area showed that hypertension (57%), obesity (42%), and diabetes (34%) were the most common comorbidities^[6].

Interestingly, all these comorbidities, including age, are also strongly associated with physical inactivity and sedentary behavior^[7,8]. On the other hand, it is widely known that physical exercise, both aerobic and resistive, is an excellent tool to prevent and manage these comorbidities^[9]. In addition, immune system can be boosted with regular exercise, with an additional anti-inflammatory effect^[10,11]. This could also contribute to fighting the inflammatory/cytokine storm of COVID-19^[3].

Hence, even though there are so many aspects to account for, it is not hard to infer that physically active people may have a better prognosis if infected by COVID-19. However, despite the worldwide awareness about the health benefits of exercise, physical inactivity habits are getting more prevalent around the world^[12]. Why is that? And what are we going to do, in terms of physical activity, after this pandemic is under control?

FIRST THINGS FIRST: WE WERE DESIGNED TO MOVE

Some generations ago, physical activity was part of humans' daily life and survival. We "walked, ran, lifted and carried, we pushed and pulled; we dug, harvested and gathered; we danced, jumped and climbed. But things have changed-We have changed"^[13]. Well, what, and when did we change?

Briefly, we can say that social, technology, and economic development through the last two centuries brought industrialization and urbanization in a large scale to most countries. Along with these changes, both professional and domestic activities became less active^[13]: Too much sitting at work, too much time driving inside a car, and too much television at home^[8]. More recently, too much smartphones and notebooks are everywhere. Hence, main opportunities to maintain physical activity are in moments of leisure^[13]. Unfortunately, it seems like things are worsening.

PHYSICAL ACTIVITY LEVELS PROJECTION

There is growing evidence that sedentarism has increased in the last decade^[12]. Thus, projections of physical activity levels (PALs) are not promising. In developed countries, such as United States and United Kingdom, PALs are expected to reduce by 46% and 35%, respectively, until 2030. In countries with emergent economies, such as Brazil, China, India, and Russia, reduction in PALs until 2030 is expected to reach 34%, 51%, 14%, and 32%, respectively^[13]. In other words, even though we were *designed to move*, we are getting more sedentary, and counting! The big problem is that this lack of physical activity is not without consequences and costs.

Besides the increased risk of COVID-19 comorbidities associated with physical inactivity^[7,8], strong and recent evidence shows that the risk of all-cause mortality is also closely related to it. For instance, individuals watching television ≥ 4 h per day present 80% increased risk of all-cause and cardiovascular disease mortality^[14]. If we look closely, we will see that this information is not new. We have been warned of the risks of physical inactivity to the cardiovascular system and mortality since the 1950s with the work of Morris and Crawford^[15] and then in the 1980s with the work of Paffenbarger *et al*^[16]. Briefly, these publications showed that physical activity may prevent coronary disease and increase longevity compared to sedentary or people engaged in less active work.

Moreover, economic consequences of physical inactivity are high to the public health systems. For instance, in Canada, physical inactivity represents 3.7% of the overall health care costs. In China, more than 15% of both medical and non-medical costs per year are attributable to physical inactivity^[8]. In contrast, small changes in physical inactivity levels can be strongly beneficial. In Australia, for example, it was estimated that a 10% reduction in inactivity levels would result in a 96 million (Australian dollars) reduction in health sector costs per year, allied with an increase in work force production^[17]. Yet, it is estimated that, until 2030, health care costs related to inactivity will increase around 113% and 61% in the European Union Association and United Kingdom, respectively; whereas in Brazil and China, these values are expected to reach 182% and 453%, respectively. To be more specific, by 2030, the direct costs related to inactivity consequences in United States, Russia, and Brazil are expected to reach 191, 3.4, and 6.2 billion dollars, respectively^[13].

TIME TO REAPPRAISE PHYSICAL INACTIVITY HABITS

So, evidence shows that COVID-19 mortality rates are higher among people with comorbidities. Also, it is known that physical inactivity and sedentary behavior lead to the appearance of these COVID-19 deadly comorbidities, especially hypertension, diabetes, and obesity. Yet, even though scientific-based information was already available about physical activity health and economic benefits, humankind is becoming more sedentary and less prepared, from a physiological perspective, to fight a hazardous infection like COVID-19. Thus, while facing this pandemic, it is time to think about the physiological, health, social, and economic relevance of regular and well oriented physical exercise. Of note, literature shows that people who exercise with direct professional supervision and periodized exercise schemes present greater adaptations compared with low supervision and non-periodized training^[18,19]. This highlights the relevance of investments in this area. It is also relevant to point that some exercises are safe to be performed indoor while social distance is still recommended. Yoga, low intensity body weight exercises, and active video games are amongst the options.

CONCLUSION

Urgent reappraisal of our physical inactivity habits should be done, again!

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