

## **COVID-19 pandemic: a wake-up call for lifestyle-related preventable conditions in older adults**

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The coronavirus disease 2019 (COVID-19) pandemic has dominated nearly every aspect of the world for more than a year. Medical services have been affected significantly, with prioritization of COVID-19 patients and delays in elective cases leaving vulnerable population at increased risk of developing non-communicable diseases or worsening of their pre-existing illnesses [1]. Hypertension, diabetes, and cardiovascular and cerebrovascular diseases are the most prevalent conditions associated with increased severity and mortality in COVID-19 patients, as well as advancing age, excessive body mass index (BMI), frailty, and various other chronic conditions. The elderly population in particular is likely to worsen their underlying debilitating conditions during the ongoing pandemic, making them more prone to both infectious and non-communicable conditions [2]. Considering the susceptibility of these individuals, routine follow-up and modification of current treatment might be interrupted or even postponed indefinitely during the current pandemic, increasing the burden of already overwhelmed medical workers.

Long before the coronavirus disease 2019 (COVID-19) outbreak, physical inactivity was considered a global pandemic that was often underestimated or even ignored by communities and public health authorities [3]. During the current long-lasting pandemic, people continue to move less for various reasons bringing the trends of physical inactivity and sedentarism to new heights. The lack of physical activity is the fourth leading cause of mortality worldwide, a significant contributor for poor physical and mental health outcomes, as well as a huge social and economic burden on the population and government. Likewise, sedentary behaviours carry similar consequences which require the simultaneous attention of public

health efforts [4]. To date, public health authorities have focused on limiting the spread of transmission through widely applied mitigation approaches, including lockdowns, travel bans, isolation, quarantine, social distancing, personal protective measures as well as hygiene measures such as environmental and surface cleaning, while forgetting to emphasize the importance of engaging a physically active lifestyle [5]. Obesity prevention and physical activity promotion are at least as important as the extensively implemented restrictions during the current pandemic.

Both physical inactivity and sedentary behaviours have been consistently associated with greater risks of adverse health outcomes [6, 7]. Although these two entities are closely related, they have different meanings. Physical activity refers to any bodily movement (characterized by its modality, frequency, intensity, duration and context of practice) produced by the contraction of skeletal muscles which increases energy expenditure beyond the resting metabolic rate. In terms of physical inactivity, it can be defined when someone does not fulfil the criteria or guideline of physical activity. Meanwhile, sedentary behaviours refer to any waking behaviours identified by an energy expenditure of  $\leq 1.5$  METs (metabolic equivalent of tasks), while in a sitting, reclining, or lying posture [8]. These adverse and unhealthy lifestyles, along with unfavourable dietary habits, clearly elevate the risk of being overweight and obese, having poor cardiometabolic health and fitness developing non-communicable conditions as well as contracting various infectious diseases [9, 10].

With regard to the COVID-19 severity and mortality, a higher risk of hospitalization, ICU admission, and death has been observed in physically inactive individuals compared to those engaging in a variety of physical activity [11]. Behind the severe course of COVID-19, there is hyperinflammation due to chronic, systemic, low-grade inflammation driven by comorbidities. Inadequate physical activity is known to be an independent risk factor for a range of chronic, lifestyle-related, preventable conditions (e.g. obesity, diabetes mellitus type

2, hypertension, dyslipidemia, cardiovascular and cerebrovascular diseases) which are among the comorbidities associated with severe COVID-19 infection [9, 12]. Meeting physical activity requirements has been advocated by the World Health Organization (WHO) to gain health benefits and mitigate health risks, but this has not been met by the vast majority of people.

In today's digitalisation era where the majority of people work, study, socialize, or even spend their leisure time virtually, exacerbated by the COVID-19 containment, trends in physical inactivity and sedentary behaviour will worsen [4]. In society, the elderly population is at high risk of developing severe COVID-19, taking into account advancing age and the presence of comorbidities. Such high-risk individuals are largely confined by COVID-19 restrictions, urged to stay at home and even postpone their routine medical follow-ups or elective procedures, thus limiting their mobility and consequently inducing sedentariness. Hence, in the near future, the wave of non-communicable diseases and frailty conditions (e.g. osteoporosis, sarcopenia) may appear inevitable without appropriate intervention of public health authorities around the world [1, 2]. This is a wake-up call to create a more sustainable approach to help individuals, especially older people, practicing physically active lifestyle. We advocate that physical activity now more than ever must receive special attention from the governments and health authorities and should be prescribed by health professional to prevent and treat a wide variety of physical and mental health problems, especially in the elderly population [13].

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