

Home-based training strategy to maintain muscle function in older adults with diabetes during COVID-19 confinement

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On 11 March 2020, the World Health Organization (WHO) declared a global pandemic caused by a new virus of the family *Coronaviridae* that later was denominated severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Like others in the coronavirus family, this virus causes various clinical manifestations under the term coronavirus disease 2019 (COVID-19), including respiratory symptoms that vary from the common cold to severe pneumonia with respiratory distress syndrome, septic shock, and multiorgan failure.¹ Since the beginning of the epidemic nearly 2 million cases have been detected worldwide and numbers are rapidly increasing (1 934 583, updated data 14 April 2020).²

Governments in many countries have adopted strategies proposed by Chinese experts and supported by the WHO to contain the virus, which may lead to movement restrictions for most of their citizens.³ Potential negative health effects of isolation need to be addressed. Studies have shown that prolonged confinement (eg, in submariners) can result in loss of muscle strength in 2 months⁴ and that only 7 days of bed rest are needed to impair insulin sensitivity and exercise capacity in healthy young men.⁵ The joint effort of the world scientific community is generating a large amount of information that is rapidly modified with new evidence, most of it regarding interventions to treat and control COVID-19.^{1,6} However, there is a lack of information available about

strategies to maintain health while confined during this pandemic, especially in at-risk populations like older adults and people suffering from type 2 diabetes (DM2) and respiratory and cardiovascular diseases.^{1,6} In addition, those individuals recovering from COVID-19 can be expected to have even greater loss of muscle strength. Maintaining muscle mass and its principal functions (strength, power, and endurance) is particularly critical in diabetic older adults undergoing a situation of home confinement.⁷

Physical activity has been shown to be a very effective strategy in the prevention and treatment of DM2, with similar benefits from both endurance and strength training on insulin sensitivity and glycemic control,⁸ increased fitness levels,⁹ and decreased risk of disability.¹⁰ Moreover, strength training focusing on performing the concentric phase of the movement as fast as possible has been shown to improve physical performance in DM2 frail older people.¹¹

The Supplement provides a simple, well-structured multicomponent training program that older DM2 adults could follow at home. The exercise protocol has been developed to maintain muscle mass, strength, and therefore glycemic control and functional ability.^{7,10} Other important aspects like mobility, flexibility, and balance are also included. In general, this training program is suitable for older adults without severe mobility and/or balance limitations, as well as other medical

conditions that would prevent them from performing exercises using high movement velocities (ie, recent hip fractures, stroke). In those cases, mobility-oriented physical activities have been demonstrated to be a better option to improve physical function.¹⁰ On the other hand, those patients with chronic inflammatory rheumatic and musculoskeletal diseases could benefit from the present training protocol, because of the growing evidence on the anti-inflammatory effects of exercise that may help manage inflammation.¹² It is also important to mention that those persons suffering from foot ulcers or advanced neurodegeneration should avoid exercises involving impacts against the floor that could induce microtrauma.⁷

The protocol consists of 7 warm-up and activation exercises, followed by 6 lower and upper extremity strength exercises, and a final cooldown composed of 7 exercises. The training session can be performed 2-3 times/week, in combination with aerobic training 2-3 times/week as the American Diabetes Association recommends.⁷ The session should be completed with a moderate level of perceived fatigue but avoiding high levels of perceived intensity and/or pain/discomfort.

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DISCLOSURE


We declare no competing interests.

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SUPPORTING INFORMATION

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