

Covid-19 Pandemic: The Need for Exercise During and After the Social Isolation of the Geriatric Population

Covid-19 Pandemisi: Geriatrik Popülasyonun Sosyal İzolasyon Sırasında ve Sonrasında Egzersiz İhtiyacı

Hüseyin Tolga Acar¹, Sabriye Ercan¹

¹ Süleyman Demirel Üniversitesi, Tıp Fakültesi, Spor Hekimliği Ana Bilim Dalı, Isparta

Geriatric bireyler, yaşlanma sürecinin getirdiği bazı fizyolojik değişikliklerden dolayı klinisyenler açısından özel dikkat gerektiren gruplar arasındadır. Koronavirüs ailesinin bir üyesi olan SARS-COV-2 virüsünün neden olduğu ağır solunum yolu enfeksiyonu, tüm dünya çapında bir salgına neden olmuştur ve özellikle yaşlı, ek kronik hastalığı olan bireyler üzerinde yüksek mortaliteye sahiptir. Bu sebeple, birçok ülke yönetimi özellikle geriatrik yaş grubunda uygulanmak üzere çeşitli sosyal izolasyon önlemleri alarak bu yaş grubuna olan bulaşı engellemeye çalışmaktadır. Fakat bu sosyal izolasyon dönemi sırasında her yaş grubunda karşılaşılabilecek fiziksel ve mental birtakım sorunlar ortaya çıkabilmektedir. Yaşlı bireylerde ise bu değişiklikler daha kritik sonuçları olabilecek ve özel yaklaşım gerektiren sonuçlar doğurabilmektedir. Biz de bu kısa derlememizle, sosyal izolasyon sırasında ve sonrasında geriatrik yaş grubundaki bireylerde düzenli egzersizin gerekliliğine ve yapılabilecek egzersiz çeşitlerine dikkat çekmek istedik.

Anahtar kelimeler: Koronavirüs, egzersiz, geriatri, sosyal izolasyon

Geriatric individuals are among the groups that require special attention for clinicians due to some physiological changes brought about by the aging process. Severe respiratory infection caused by the SARS-COV-2 virus has caused a worldwide pandemic and has a high mortality, especially in elderly people with additional chronic disease. For this reason, the management of many countries tries to prevent transmission to this age group by taking various social isolation measures to be applied especially in the geriatric age group. However, during this social isolation period, some physical and mental problems may arise in any age group. In older individuals, these changes may have more critical results and require special approach. With this short review, we wanted to draw attention to the necessity of regular exercise and the types of exercise that can be done in individuals in the geriatric age group during and after social isolation.

Keywords: Coronavirus, exercise, geriatrics, social isolation

Sorumlu Yazar/ Corresponding Author: Dr. Hüseyin Tolga ACAR¹

E-posta/E-mail: tolgacar_32@hotmail.com

Adres/ Adress: Süleyman Demirel Üniversitesi, Tıp Fakültesi, Spor Hekimliği Ana Bilim Dalı, 32260, Isparta, Türkiye

Telefon/ Phone: +90 246 211 00 00

Geliş Tarihi/ Received: 29.05.2020 **Kabul Tarihi/ Accepted:** 26.08.2020

INTRODUCTION

In December 2019, a public health problem occurred with the increasing number of respiratory tract infections and high morbidity and mortality rates observed in people suffering from this disease due to an unknown agent at the time in Hubei city, Wuhan province, China (1). As a result of further studies such as virus isolation within the next few weeks, the factor causing this severe upper respiratory tract infection (SARS); It was discovered that there was a new subtype of the Coronavirus family (SARS-Cov-2), which caused 774 deaths (Mortality rate = 9.6%) in Hong Kong in 2003 and 858 deaths (Mortality rate = 34.0%) in Saudi Arabia in 2012 (2). Despite the various strategies that Chinese state authorities have applied to stop this epidemic emergency, the cause of infection has spread all over the world (1). On the 30th of January 2020, the World Health Organization (WHO) defined public health emergencies to be internationally concerned with the prediction that this pandemic may affect the whole world (3). According to WHO data, as of today (29/05/2020), the number of confirmed cases of infected cases worldwide is 5 701 337, while the number of confirmed deaths is 357 688 (4).

With the rapid spread of coronavirus worldwide, many countries have had to resort to different practices, such as social isolation, the use of mask, strict compliance with hygiene rules, and even the restriction of going out of basic needs. Such restrictions that have been put into practice have provided scientists throughout the war between infectious diseases and humanity throughout history; it has saved time in the development of various methods such as vaccine, drug and antibody therapy. It was also used during many epidemics such as Plague, Spanish Flu and Smallpox outbreaks. Nowadays, all countries facing pandemic have had to apply social isolation method, especially to the geriatric population, in a dynamic process. The social isolation measures applied are likely to affect the mental and physical

health and health-related thoughts of individuals of all age groups in the affected communities (5). However, the practical implementation of social isolation measures may create significant challenges for the health and well-being levels of older adults (especially those who are weak, fond, very old or have more than one chronic condition) in the community (6). Clinical studies conducted during pandemic, these very old adult individuals whose features are mentioned, if they get Covid-19 infection; points out that morbidity risks such as hospitalization, intubation and mortality rates are high (6,7). A number of health risks can also be faced after discharge from elderly individuals who are followed up in the hospital due to coronavirus infection or existing comorbid conditions. For example; An elderly patient after a 10-day hospital stay, loses 16% of average muscle strength and 6% of muscle mass (8). In addition, after discharge from the hospital, geriatric individuals have a particularly high risk of in-home falls (34% within 3 months after discharge) and reduced ability to do their daily work (33% functional capacity decrease within 1 year after discharge) (9). At the same time, individuals in the geriatric population have a high risk of morbidity and mortality in terms of many other acute and chronic conditions that exist or may develop. However, their ability to adapt to stringent social isolation measures and their changing metabolism from immobilization, which may accompany this condition, may remain weak (6).

Although elderly individuals in the community have high mortality risks due to clinical problems caused by Covid-19 infection, it is also important to manage existing comorbid diseases and to regulate their treatment. In this war against the pandemic, it should be the priority of clinicians to pay attention to and overcome the difficulties caused by social isolation for the older adults, perhaps the most vulnerable group (6). Though loneliness and possible depressive mood appear as situations

that geriatric individuals may encounter during social isolation, these represent only the visible part of the iceberg. The current well-being of many elderly individuals is influenced by changes in their daily lives rather than medical interventions or pharmacological treatments (6). For example, exacerbation of clinical signs of existing chronic heart failure can occur due to changes in the usual food variety, meal or portion during social isolation or quarantine applications. In addition, due to physical activity or lack of exercise, results such as weakness, sarcopenia and possible in-home falls that can have fatal consequences may occur. Similarly, decreased socialization and decreased cognitive inputs provided by establishing a relationship with a wider environment can worsen dementia symptoms (10). In terms of all such risks that are present or likely to occur for the elderly population, and their compliance with social isolation during the Covid-19 pandemic should be followed in detail by healthcare professionals. The methods proposed in the literature for this tracking system are as follows; telephone or video conferencing methods (6). However, for some older adults, some difficulties may arise as a result of special physiological changes. Special conditions such as hearing loss, cognitive impairment, and lack of familiarity with new technology can prevent these methods from being used effectively (11). Nevertheless, the fact that geriatric individuals, especially those living in rural areas, have the only chance to reach healthcare should be remembered.

According to WHO definition, healthy aging is largely determined by the individual's ability to maintain both mental and physical capacity (12). Considering recent medical developments, there are no pharmacological agents that can help maintain physical capacity, and it seems that it will not be in daily use of people in the near future (9). However, current physical capacity can be maintained in the presence of regular physical stimuli and regular exercise. It is well known

that regular physical activity plays a key role in health, general well-being and survive, especially for people over the age of eighty five (13). In addition, in a meta-analysis involving recent and prospective studies, achieving regular physical activity levels recommended by WHO; It was concluded that 17% lower risk of cardiovascular disease, 23% lower risk of cardiovascular mortality, 26% lower Type 2 Diabetes Mellitus (Type 2 DM) incidence and decreased in various cancer incidence, especially breast and colon cancer (14). Similar to these results, in another recent study, physical activity deficiency and immobilization was associated with 24% higher risk of Coronary Artery Disease (CAD), an increased risk of 16% stroke and 42% higher risk of Type 2 DM (15). In light of all these scientific evidences, another important point is that geriatric individuals with the above-mentioned comorbid conditions tend to have a higher mortality rate compared to individuals without comorbid disease if they have severe respiratory infections caused by Covid-19 (16). In today's world, where social isolation measures are applied in many countries, exercise programs that can be implemented by older individuals and adapted according to the social isolation rules are important in order to maintain the existing well-being of the geriatric population and to minimize the risks mentioned above.

There is a physiological-based relationship in the form of 'J' between physical activity and susceptibility to respiratory tract infections, particularly viral infections. Following moderate-intensity physical activity, an increase in neutrophil and natural killer (NK) cell numbers and an increase in salivary IgA concentrations are detected (17, 18). At the same time, moderate-intensity physical activity increases the blood concentration of stress hormones. Thus, it causes a decrease in the negative effects of inflammation (18). It is known that upper respiratory tract infections decrease by 20-30% in individuals with moderate-intensity physical activity regularly

63

in their daily lives (18, 19). However, after prolonged and high-intensity exercise, an immune suppression develops within a few hours, thereby increasing the risk of major viral respiratory infections transmission during this period (20). Therefore, in areas without curfews, under social distance and necessary personal precautions; a total of at least 150 minutes a week (3-5 days), moderate-intensity (non-high intensity) regular aerobic exercise and at least 2 days a week, including large muscle groups (such as shoulders, thighs, core stabilization muscles), 3x10 repetitions, strength exercises are beneficial for geriatric individuals and should be recommended (21). However, as stated earlier, geriatric individuals who are under social isolation due to high risk of contamination (from person to person or from contaminated surfaces) are recommended to exercise in well-ventilated private environments (e.g. at home) and with the help of personal materials or simple equipment (20). According to a suggestion in the literature, a combination of aerobics (such as walking in the home or on a treadmill), strength, stretching and balance exercises should be included in the home exercise program (22). Physical activities and exercises to be performed outdoors are generally more applicable and diverse. It also has more facilities and infrastructure to perform any kind of exercise. Apart from all these scientific suggestions, in public gymnasiums and crowded environments, the possible harms of high-intensity exercise can outweigh the advantages and these risky behaviors should be avoided as much as possible (20).

The necessity of exercising the geriatric population, which is also supported by scientific evidence, is also very important during social isolation and after the transition to the order that can be described as 'New Normal'. As, preserving the existing reserve of organ systems will both facilitate the management of comorbid ailments, and Covid-19 will reduce the risk of development and the severity of the disease even if it develops (23).

When designing a suitable exercise program for older individuals under social isolation, each feature of the proposed exercises should be carefully considered, just as when preparing an exercise prescription, and the geriatric individual who is recommended to exercise should make sure that he fully understands the exercises. The exercises to be performed at home, how often they should be done, their intensity and intensity should be specified in detail. Especially, in very elderly people with comorbid diseases, more care should be taken when creating an exercise program compared to healthy elderly individuals. Although there are recommendations of international exercise planning guidelines, as in all age groups, the exercise program should be planned individually.

EXERCISE MODALITY

Programs with combinations of different exercises should be preferred in this age group instead of a single exercise type. In this way, the benefits of regular exercise at different parameters on the health and well-being levels of individuals can be observed (23). A multi-component exercise program should be planned in a way that includes aerobic, strength, resistance, flexibility, balance, coordination and proprioception exercises (24). With the rapid development of technology, especially in the 21st century, some researchers argue that promoting physical activity through the internet, mobile smartphone apps, exercise training videos, wearable technological equipment and various game consoles is more effective in maintaining physical and mental well-being during this critical period (22,25).

EXERCISE FREQUENCY AND DURATION

For the geriatric population, as suggested by the WHO and international consensus; at least 5 days a week of moderate-intensity (at least 150-300 minutes per week) or high intensity (at least 75 minutes per week) aerobics, at least 2 days a week resistance or strength exercises

for large muscle groups (at least 30 repetitions per day, 3 in the form of a set) and also on days without strength exercise; balance, coordination and proprioception exercises are recommended (20,21). However, in order to tolerate the reduction of daily physical activity caused by social isolation, up to 400 minutes of aerobic exercise per week is recommended by researchers (23). Exercises to be applied during coronavirus pandemic should be adapted to special social isolation conditions and attention should be paid to the use of necessary personal protective equipment.

EXERCISE INTENSITY

The recommended intensity for most exercise types is moderate intensity (65-75% of the maximum heart rate for aerobic exercise). It should be ensured that the elderly person can understand the target of exercise intensity by describing the moderate intensity that should be achieved while doing aerobic exercise to the geriatric population as "You can talk to the person next to you but you cannot sing a song" (21,23). For strength exercises, the value called 1 repetition maximum (1 RM) should be calculated by determining the maximum weight that the geriatric individual can lift only once in full joint range of motion. Strength exercises involving large muscle groups recommended at medium intensity should be 50-75% of 1 RM at intensity, at least 2 days a week and 8-10 repetitions (23). It is well known that moderate-intensity exercise improves the immune system in particular, and even high-intensity exercises can have dangerous consequences that can lead to sudden cardiac death, especially in elderly individuals with fond and comorbid diseases (23). Therefore, regular exercise with moderate-intensity is an ideal choice for geriatric individuals during and after social isolation.

IN-HOME EXERCISE EXAMPLES

Aerobic exercises are generally recommended to be performed outdoors. However, different options such as treadmills or stationary bikes

can be used to exercise in the home environment. In addition, older individuals should be able to exercise without the need for special equipment for their exercises and with the help of objects that can be present in any home environment. For this, aerobic exercises such as moderate-intensity walks in home, daily housework and outdoor walks with protective equipment in accordance with social distance rules are recommended (23). Apart from these, exercises such as stair climbing, body weight exercises (push-ups, squats, sit-ups, core stabilization exercises, etc.), sitting and standing on chair, carrying lightweight items such as water bottles, vegetables or rice bags should be done. In addition, balance and coordination exercises such as walking with eyes open and closed in a line on the floor, walking on the toes and heel, and overcoming obstacles at low heights are also recommended (20,23,26). Exercises containing isometric contractions mentioned above should be started under the supervision of a physician before being given as home exercises to elderly people with comorbid cardiac and pulmonary system diseases. Some researchers also recommend dancing and traditional exercise methods such as yoga, including range of motion exercises and stretching exercises (26). However, while giving all these exercise suggestions, it is critical to determine the current physical capacity of individuals, to take measures related to comorbid diseases, if any, and to inform patients in detail. For example, if the necessary measures are not taken before or during exercise in a geriatric individual diagnosed with Type 2 DM, a possible hypoglycemia that may occur during exercise may have fatal consequences (26). In addition, the evaluation of their current medical conditions and comorbid diseases by the relevant specialist physicians before giving exercise recommendations to elderly people with comorbid diseases may minimize the possibility of encountering possible health problems.

As a result, exercising at home has many proven benefits during social isolation and controlled social life. Despite all these difficulties, we support the motto 'At least a little exercise is better than not doing at all'. We want our sincere wishes to end this pandemic, which affects the whole world, as soon as possible. Finally, we offer our endless thanks to all our healthcare workers, especially our physician colleagues, who work with extraordinary effort both in our country and in every healthcare institution in the world.

Conflict of interest and funding

The authors declare no conflict of interest.
The study was not funded.

REFERENCES

1. Guan W-j, Ni Z-y, Hu Y, et al. Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med.* 2020; 382: 1708-20.
2. de Oliveira Neto L, Elsangedy HM, de Oliveira Tavares VD, et al. # TrainingInHome-Home-based training during COVID-19 (SARS-COV2) pandemic: physical exercise and behavior-based approach. *Rev Bras Fisiol Exerc.* 2020; 19.
3. World Health Organization. Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV). 2020. Available at: [https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-\(2005\)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-\(2019-ncov\)](https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov)). (Accessed: 29/05/2020).
4. World Health Organization. Novel Coronavirus (2019-nCoV) Situation Report - 130. Available at: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200529-covid-19-sitrep-130.pdf?sfvrsn=bf7e7f0c_4. (Accessed: 29/05/2020)
5. Allen PM, Smith L. SARS-CoV-2 self-isolation: recommendations for people with a vision impairment. *Eye (Lond).* 2020; 1-2.
6. Steinman MA, Perry L, Perissinotto CM. Meeting the care needs of older adults isolated at home during the Covid-19 pandemic. *JAMA Intern Med.* 2020.
7. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet.* 2020; 395: 497-506.
8. Kortebein P, Ferrando A, Lombeida J, et al. Effect of 10 days of bed rest on skeletal muscle in healthy older adults. *JAMA.* 2007; 297: 1769-74.
9. Aubertin-Leheudre M, Rolland Y. The importance of physical activity to care for frail older adults during the Covid-19 pandemic. *JAMDA.* In: Elsevier; 2020.
10. Donovan NJ, Wu Q, Rentz DM, et al. Loneliness, depression and cognitive function in older US adults. *Int J Geriatr Psychiatry.* 2017; 32: 564-73.
11. van den Berg N, Schumann M, Kraft K, et al. Telemedicine and telecare for older patients-A systematic review. *Maturitas.* 2012; 73: 94-114.
12. Beard JR, Officer A, De Carvalho IA, et al. The World report on ageing and health: a policy framework for healthy ageing. *Lancet.* 2016; 387: 2145-54.
13. Izquierdo M, Morley JE, Lucia A. Exercise in people over 85. *BMJ (Clinical research ed.).* 2020; 368, m402.
14. Wahid A, Manek N, Nichols M, et al. Quantifying the association between physical activity and cardiovascular disease and diabetes: a systematic review and meta-analysis. *J Am Heart Assoc.* 2016; 5: e002495.
15. Kivimäki M, Singh-Manoux A, Pentti J, et al. Physical inactivity, cardiometabolic disease, and risk of dementia: an individual-participant meta-analysis. *BMJ.* 2019; 365: 11495.
16. Lippi G, Henry BM, Sanchis-Gomar F. Physical inactivity and cardiovascular disease at the time of coronavirus disease 2019 (COVID-19). *Eur J Prev Cardiol.* 2020; 2047487320916823.
17. Martin SA, Pence BD, Woods JA. Exercise and respiratory tract viral infections. *Exerc Sport Sci Rev.* 2009; 37: 157.
18. Harris MD. Infectious disease in athletes. *Curr Sports Med Rep.* 2011; 10: 84-9.
19. Ahmadinejad Z, Alijani N, Mansori S, et al. Common sports-related infections: a review on clinical pictures, management and time to return to sports. *Asian J Sports Med.* 2014; 5: 1.
20. 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: e102630.
21. Nacı B, Kudaş S, Borman P, ve ark. Yaşlılarda fiziksel aktivite. Editör; Doğan A. T.C. Sağlık Bakanlığı, Türkiye fiziksel aktivite rehberi, 2. Baskı, Türkiye Halk Sağlığı Kurumu, Ankara, 2014. https://hsgm.saglik.gov.tr/depo/birimler/saglikli-beslenme-hareketli-hayat-db/Fiziksel_Aktivite_Rehberi/3-_Yaslilarda_Fiziksel_Aktivite_baski.pdf. (Erişim Tarihi: 21/08/2020)
22. Chen P, Mao L, Nassis GP, et al. Wuhan coronavirus (2019-nCoV): The need to maintain regular physical activity while taking precautions. *J Sport Health Sci.* 2020; 9: 103.
23. 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.
24. Cadore EL, de Asteasu MLS, Izquierdo M. Multicomponent exercise and the hallmarks of frailty: Considerations on cognitive impairment and acute hospitalization. *Exp Gerontol.* 2019.
25. Tate DF, Lyons EJ, Valle CG. High-tech tools for exercise motivation: use and role of technologies such as the internet, mobile applications, social media, and video games. *Diabetes Spectr.* 2015; 28: 45-54.
26. Banerjee M, Chakraborty S, Pal R. Diabetes self-management amid COVID-19 pandemic. *Diabetes Metab Syndr.* 2020; 14: 4: 351.