

Health Benefits of Physical Activity

In the context of COVID-19



UW Medicine

Routine physical activity is essential to human health and now, more than ever, we must encourage this message as essential. Approximately 95% of COVID-19 deaths are among people with pre-existing chronic diseases, including obesity, type 2 diabetes, hypertension and cardiovascular disease. Physical activity reduces the risk of all of these diseases and we have prepared statistics supporting

Physical Activity & COVID-19 Pandemic

- COVID-19 has had a widespread impact on public health. As of June 1, 2020, the World Health Organization reported over 6 million cases globally and nearly 2 million cases in the US¹⁹.
- Individuals with medical conditions associated with inactive lifestyles including heart disease, diabetes, and obesity¹ are more likely to be hospitalized⁷ and have higher rates of morbidity and mortality¹.
- Even prior to the COVID-19 pandemic, 80 percent of American adults did not meet the US Physical Activity Guidelines for exercise and 66 percent of American children were physically inactive every day¹⁷.
- Physical inactivity accounts for \$117 billion annually⁴ of US health care expenditures.
- Exercise is integral for the prevention and management of chronic conditions and can boost immune function^{5,6,11,18}.
- Stay-at-home orders, which have globally restricted activity, can unfortunately disrupt exercise routines, increase sedentary time, and unhealthy eating habits^{2,8,13}.
- Exercise improves cardiorespiratory fitness, muscular strength, and agility which are directly related to the function of the respiratory, circulatory, muscular, nervous, and skeletal systems⁸. The improved function of these systems may help people in becoming more resilient in fighting COVID-19⁷.
- Now is the time to integrate exercise into new routines and include exercise prescription as a critical part of healthcare.
- Exercise is an accessible solution to improve population health and resilience to respiratory infections.

Physical Activity and Mental Health

- 1 in 3 Americans report that the COVID-19 quarantine is having a serious impact on their mental health¹⁵.
- A variety of stressors have increased during the COVID-19 quarantine including concerns about finances, fear of infection, inadequate supplies, inaccurate information, stigma, and frustration^{8,15}.
- Exercise has been shown in some studies to be as effective as antidepressants in reducing symptoms of mild-to-moderate depression¹⁵.
- Regular aerobic exercise can ease symptoms of anxiety by decreasing the body's reaction to stress.¹⁵
- Evidence suggests that walking, particularly outdoors, can aid in the prevention and treatment of depression and anxiety⁹.
- Adults 60 years and older with higher physical activity levels showed a 21% reduction in risk for depression compared to those with lower physical activity levels³.

Physical Activity and Immune Support

- COVID-19 has prompted more people to become increasingly sedentary. This has a significant impact on population health, especially for those with diseases like diabetes, high blood pressure, heart disease, and respiratory disease, because physical activity is important for maintaining adequate health status⁸.
- It is well known that muscle wasting and cardiorespiratory deconditioning occur rapidly with sedentary behavior (e.g., bed rest) and may have the largest impact on patients who are frail or elderly with multiple medical conditions¹⁶ further deteriorating immune function.
- Exercise is considered the “polypill” of disease⁸ and may protect against COVID-19⁸.
 - Improved cardiorespiratory fitness is directly related to the function of the respiratory, circulatory, muscular, nervous, and skeletal systems, and implicated in the function of the endocrine, digestive, immune, and renal systems⁸.
 - Physical activity becomes especially important for older people during quarantine to maintain physiologic function⁸.
 - Exercise in older people positively affects and prevents frailty, risk of falls, cognitive decline, and improves strength, muscle mass, and self-esteem⁸.
 - Exercise may enhance immune response to prevent upper respiratory tract infections.
- Habitual exercise improves immune regulation and generally reduces illness risk¹⁶.
- This introduces the idea of prehabilitation with regard to COVID-19, which is the idea of creating interventions for patients aimed at improving patients' health before a physiologic stressor, such as coronavirus, so they can better handle the stress if it presents¹⁶. Prehabilitation may have the greatest positive effect on the most vulnerable such as elderly patients with multiple medical conditions¹⁶ and support immune function.

Physical Activity and Adult Obesity

- While it is known that COVID-19 is more fatal in patients who are older or with existing conditions such as high blood pressure, heart disease, and diabetes, experts also recently reported that COVID-19 is more fatal in patients with obesity¹.
- The pandemic contributes to increasing rates of obesity because it produces undesired effects of prolonged sedentary behavior¹.
- Past pandemics, such as the 2009 influenza A H1N1 pandemic, demonstrated that obesity is a risk factor for greater illness symptom severity¹.
- The additional physical stress of extra weight on the body due to obesity can affect immune cell trafficking and inflammation in the lungs, posing unique challenges for COVID-19 patients experiencing obesity¹.
- Nutritional habits have also changed in the population, with a likelihood of reduced availability of foods, limited access to food caused by restricted store hours, and a switch to unhealthy foods¹³.
- COVID-19 is unprecedented, and many people are stressed and anxious. Because of this, people are turning to increased consumption of unhealthy food (e.g. snacks, hamburgers, soda, and chocolate) and alcohol (wine and spirits) to self-soothe, also called stressed-related eating. This increases cardiovascular risk mainly in high-risk patients¹³, contributing to COVID-19 severity.
- Physical activity can mitigate the downstream effects of poor nutrition, decreasing the risk of type 2 diabetes, heart disease, and obesity¹⁰.

References

1. Carter, S.J., Baranuskas, M.N., & Fly, A.D. (2020). Considerations for obesity, vitamin D, and physical activity amidst the COVID-19 pandemic. *Obesity*. doi:10.1002/oby.22838
2. Chen, P., Mao, L., Nassis, G.P., Harmer, P., Ainsworth, B., & Li, F. (2020). Coronavirus disease (COVID-19): The need to maintain regular physical activity while taking precautions. *Journal of Sport and Health Science*, 9, 103-104.
3. Cunningham, C., O' Sullivan, R., Caserotti, P., & Tully, M. (2019). Consequences of physical inactivity in older adults: A systematic review of reviews and meta-analyses. *Scandinavian Journal of Medicine & Science in Sports*, 30(5), 816-827.
4. Ding, D., Lawson, K.D., Kolbe-Alexander, T.L., Finkelstein, E.A., Katzmarzyk, P.T., . . . , Pratt, M. (2016). The economic burden of physical inactivity: A global analysis of major non-communicable diseases. *Lancet*, 388(10051):1311-1324.
5. Gal, R., May, A.M., van Overmeen, E.J., Simons, M., & Monninkhof, E.M. (2018). The effect of physical activity interventions comprising wearables and smartphone applications on physical activity: A systematic review and meta-analysis. *Sports Medicine - Open*, 4(48). doi: <https://doi.org/10.1186/s40798-018-0157-9>
6. Grant R.W., Schmittiel, J.A., Neugebauer, R.S., Urratsu, C.S., & Sternfeld, B. (2014). Exercise as a vital sign: A quasi-experimental analysis of a health system intervention to collect patient-reported exercise levels. *Journal of Internal Medicine*, 29(2), 341-348.
7. Hall, G., Laddu, D.R., Phillips, S.A., Lavie, C.J., & Arena, R. (2020). A tale of two pandemics: How will COVID-19 and global trends in physical inactivity and sedentary behavior affect one another? *Progress in Cardiovascular Disease*.
8. Jiménez-Pavón, D., Carbonell-Baeza, A., & Lavie, C.J. (2020). Physical exercise as therapy to fight against the mental and physical consequences of COVID-19 quarantine: Special focus in older people. *Progress in Cardiovascular Diseases*. doi: <https://doi.org/10.1016/j.pcad.2020.03.009>
9. Kelly, P., Williamson, C., Niven, A.G., Hunter, R., Mutrie, N., & Richards, J. (2018). Walking on sunshine: Scoping review of the evidence for walking and mental health. *British Journal of Sports Medicine*, 52, 800-806. doi: 10.1136/bjsports-2017-098827
10. Lee, I.M., Shiroma, E.J., Lobelo, F., Puska, P., Blair, S.N., Katzmarzyk, P.T. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *Lancet*, 380(9838), 219-229. doi: 10.1016/S0140-6736(12)61031-9.
11. Lobelo, F., Young, D.R., Sallis, R., Garber, M.D., Billinger, S.A., . . . Joy, E.A. (2018). Routine assessment and promotion of physical activity in healthcare settings: A scientific statement from the American Heart Association. *Circulation*, 137(18), e495-e522. doi: 10.1161/CIR.0000000000000559.
12. Martin, S.A., Pence, B.D., & Woods, J.A. (2009). Exercise and respiratory tract viral infections. *Exercise and Sport Sciences Reviews*, 37(4), 157-164. doi:10.1097/JES.0b013e3181b7b57b
13. Mattioli, A.V., Puviani, M.B., Nasi, M., & Farinetti, A. (2020). COVID-19 pandemic: The effects of quarantine on cardiovascular risk. *European Journal of Clinical Nutrition*. doi: <https://doi.org/10.1038/s41430-020-0646-z>
14. Nieman, D.C. & Wentz, L.M. (2019) The compelling link between physical activity and the body's defense system. *Journal of Sport and Health Science*, 8(3), 201-217.
15. Robins, L.M., Hill, K.D., Finch, C.F., Clemson, L., & Haines, T. (2018). The association between physical activity and social isolation in community-dwelling older adults. *Aging & Mental Health*, 22(2), 175-182.
16. Silver JK. Prehabilitation could save lives in a pandemic. *The British Medical Journal*. Published April 6, 2020. Accessed May 28, 2020. Retrieved from <https://www.bmj.com/content/369/bmj.m1386>.
17. US Department of Health & Human Services, President's Council on Sports, Fitness, & Nutrition (2017). *Facts & Statistics Physical Activity*. Retrieved from: <https://www.hhs.gov/fitness/resource-center/facts-and-statistics/index.html#footnote-1>
18. Walsh, J.M., Swangard, D.M., Davis, T., & McPhee, S.J. (1999). Exercise counseling by primary care physicians in the era of managed care. *American Journal of Preventive Medicine*, 16(4), 307-313. doi: 10.1016/s0749-3797(99)00021-5
19. World Health Organization. (2020, May 28). *WHO Coronavirus Disease (COVID-19) Dashboard*. Retrieved from: <https://covid19.who.int>