

Study finds pandemic led to decline in exercise performance in children and young adults

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Children and young adults experienced a decline in cardiopulmonary exercise performance during the COVID-19 pandemic, according to a

new study by researchers at Children's Hospital of Philadelphia (CHOP). The study, published in the journal *Pediatric Cardiology*, found a notable decrease in aerobic activity, which was most pronounced in children and young adults who had the highest exercise performance before the pandemic began.

"Our study shows that the COVID-19 pandemic led to a decrease in physical activity and an increase in sedentary behavior by children and [young adults](#), which in turn led to a decrease in cardiopulmonary [exercise](#) performance," said senior study author Julie Brothers, MD, a cardiologist in the Cardiac Center and Director of the Lipid Heart Clinic at Children's Hospital of Philadelphia. "Although [sports activities](#) and in-person schooling have largely resumed, future studies should examine if exercise performance has returned to pre-pandemic values. This study has public health implications and demonstrates the importance of physical activity on overall cardiovascular health."

The researchers analyzed data from 122 patients between the ages of 6 to 22 years who had a serial cardiopulmonary exercise test (CPET) at CHOP before the COVID-19 pandemic (January 1, 2019 to March 13, 2020) and at least once during the COVID-19 pandemic (June 1, 2020 to May 7, 2021).

Of the patients analyzed, most patients (81%) attended in-person school before the pandemic, whereas only 9% of patients received in-person schooling during the pandemic; a plurality of patients had either hybrid (12%) or remote (36%) school learning during the pandemic period. Nearly half (43%) of [patients](#) reported a decrease in physical activity during pandemic.

Both males and females in the study saw an increase in BMI during the pandemic and a significant decrease in aerobic capacity, even after accounting for growth between stress tests. The researchers observed the

greatest decrease in exercise performance among those who were the most aerobically fit pre-pandemic. One explanation for this finding, the researchers suggest, is that the most aerobically fit subjects were likely participating in competitive, structured sports before the pandemic, whereas those activities were canceled during the pandemic period, resulting in a more significant decline in physical activity.

"Although social distancing measures were a necessary public health measure during the pandemic, this study demonstrates unintended consequences that should be kept in mind as further policy is developed and implemented," said Danielle S. Burstein, MD, a cardiologist in the CHOP Cardiac Center and first author of the study. "Given that we know [mental health](#) and physical activity are inextricably linked, and that rates of depression and anxiety have increased during the pandemic, these findings also highlight the importance of developing mobile health strategies that encourage and allow for [physical activity](#) in children during the [pandemic](#) and at other times when the ability to exercise may be limited."

More information: D. S. Burstein et al, Cardiopulmonary Exercise Performance in the Pediatric and Young Adult Population Before and During the COVID-19 Pandemic, *Pediatric Cardiology* (2022). [DOI: 10.1007/s00246-022-02920-1](https://doi.org/10.1007/s00246-022-02920-1)

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