

# Lockdowns may affect children's fitness

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Research has found that strict lockdowns to reduce the spread of COVID-19 might be responsible for delaying normal cardiorespiratory development in children.

The study, the first to examine the topic, is published in the *European Journal of Pediatrics*. It was carried out by Dr. Lee Smith of Anglia Ruskin University (ARU) and a team of academics from Spain, led by Dr. Ruben Lopez-Bueno of the University of Zaragoza.

The research involved a group of 89 children from a school in north-eastern Spain. The country introduced a strict six-week lockdown in spring 2020, during which under-15s were unable to leave their homes except for medical reasons.

The children, aged 12-14, took part in fitness tests to measure their maximal oxygen uptake ( $VO_2$  max) in November 2019, before the start of the COVID-19 pandemic, and repeated the fitness tests in November 2020.

$VO_2$  max is a well-known [cardiorespiratory](#) fitness indicator and levels increase during adolescence, in line with physical growth and [development](#).

The study found that in November 2020, boys and girls in each age group showed lower levels of cardiorespiratory fitness than would be expected with normal  $VO_2$  max rate development. Healthy Fitness Zone (HFZ) levels—a standard measure of health based on age and sex—also fell by 3.4% over the 12-month period.

Senior author Dr. Lee Smith, Reader in Physical Activity and Public Health at Anglia Ruskin University (ARU), said: "We know that sedentary behavior has a [negative effect](#) on cardiorespiratory fitness and health, but we're unable to say to what extent the delay in development of  $VO_2$  max levels we found was caused by COVID-19 restrictions.

"In normal conditions,  $VO_2$  max levels tend to increase in adolescents up to a certain age. In our study, each age and sex subgroup showed lower levels in relation to normal  $VO_2$  max rate development and specific subgroups, such as boys aged 12 and girls aged 14, displayed reductions in their actual  $VO_2$  max levels, which could underscore a higher vulnerability in these groups.

"Our results are perhaps not as pronounced as might have been predicted. This could be because Spain relaxed their lockdown entering the summer. The children were able to take part in [physical activity](#) again, helping them to regain cardiorespiratory [fitness](#), and we did not test the group again until November.

"Regardless, if further lockdowns are necessary in future, maintaining access to open spaces such as parks and sports facilities should certainly be considered, particularly for vulnerable groups such as adolescents."

**More information:** López-Bueno, R., Calatayud, J., Andersen, L.L. et al. Cardiorespiratory fitness in adolescents before and after the COVID-19 confinement: a prospective cohort study. *Eur J Pediatr* (2021).

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