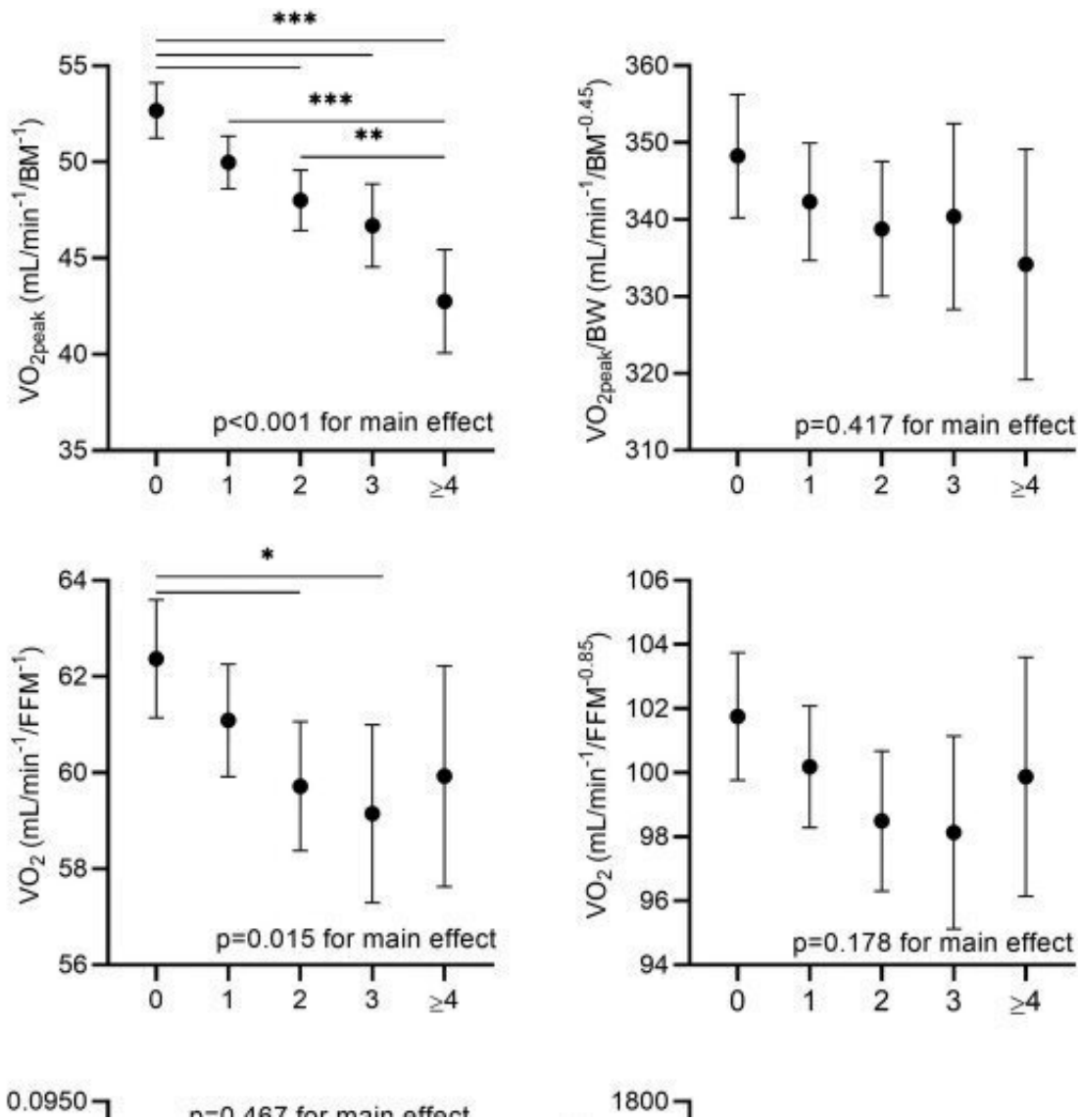


High aerobic fitness does not protect children from metabolic syndrome, study finds

October 20 2022



Differences in VO_{2peak} among children with different numbers of cardiometabolic risk factors. The metabolic syndrome was defined using the modified National Cholesterol Education Program definition and using the

population specific highest 25th percentiles of waist circumference, HDL cholesterol (lowest 25th percentile), triglycerides, glucose, and blood pressure to define cut-offs for an increased cardiometabolic risk. Credit: *Journal of Science and Medicine in Sport* (2022). DOI: 10.1016/j.jsams.2022.08.002

A study conducted in collaboration between the University of Jyväskylä and the University of Eastern Finland found that high aerobic fitness does not protect children from metabolic syndrome. The study also found that the amount of fat tissue in the body has distorted the results obtained in several previous studies on the protective effect of aerobic fitness from metabolic syndrome. The researchers also found that poor aerobic fitness is not a feature of metabolic syndrome in adults. Still, good aerobic fitness may indicate a lack of risk factors for metabolic syndrome.

Specifically, the study looked at how consideration of body size and composition affects the association between aerobic fitness and metabolic syndrome. Metabolic syndrome refers to the accumulation of hazards for metabolic and cardiovascular diseases in one person. Metabolic syndrome is characterized by high body fat, elevated [blood pressure](#), [insulin resistance](#), increased triglycerides, and lowered high-density lipoprotein cholesterol (HDL).

Based on the findings, low aerobic fitness is not a risk factor for metabolic syndrome in children. When aerobic fitness is divided by total body weight, high-fit children have a lower risk of metabolic syndrome. However, this protective effect of fitness seems to be due to differences in fat mass and not aerobic fitness.

"Our results show that being overweight or obese increases the risk of metabolic syndrome regardless of the level of aerobic fitness," says Eero

Haapala, Ph.D. from the Faculty of Sport Science, the University of Jyväskylä. "Instead of focusing on aerobic fitness, preventing metabolic syndrome should start with increasing [physical activity](#), improving diet quality, and controlling weight."

Also in adults, once body composition was adequately considered, the importance of low aerobic fitness as a risk factor for metabolic syndrome was significantly reduced. In adults, body composition was assessed by skin fold measurement. If body composition had been measured by the DXA device, the importance of aerobic fitness might have diminished further.

Although aerobic fitness had a weak association with [metabolic syndrome](#), better aerobic fitness was associated with higher HDL cholesterol levels.

The study included 352 children aged 9 to 11 years from the PANIC study and 572 men aged 53 to 72 from the KIHD study. Maximum oxygen uptake as a measure of endurance [fitness](#) was measured using a maximal bicycle ergometer test. Metabolic syndrome was determined according to international standards. In addition, in [children](#), body composition was measured using both InBody and DXA devices and by skin fold thickness measurement in adults.

The study results were published in the *Journal of Medicine and Science in Sport*.

More information: Eero A. Haapala et al, Is low cardiorespiratory fitness a feature of metabolic syndrome in children and adults?, *Journal of Science and Medicine in Sport* (2022). [DOI: 10.1016/j.jsams.2022.08.002](#)

Provided by University of Jyväskylä

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