

Brawn matters: Stronger adolescents and teens have less risk of diabetes, heart disease

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Adolescents with stronger muscles have a lower risk of heart disease and diabetes, according to a new study that examined the influence of muscle strength in sixth grade boys and girls.

Stronger kids also have lower [body mass index](#) (weight to height ratio), lower percent body fat, smaller waist circumferences, and higher fitness levels, according to the study that appears in *Pediatrics*.

Researchers analyzed health data for more than 1,400 children ages 10 to 12, including their percent body fat, glucose level, blood pressure, [cholesterol levels](#) and triglycerides (a type of fat, or lipid, which may increase risk of [heart disease](#)). Those with greater strength-to-body-mass ratios – or pound-for-pound strength capacities— had significantly lower risks of heart disease and diabetes.

"It's a widely-held belief that BMI, sedentary behaviors and low cardiovascular fitness levels are linked to diabetes, heart disease and stroke, but our findings suggest [muscle strength](#) possibly may play an equally important role in cardiometabolic health in children," says lead author Mark D. Peterson, Ph.D, M.S., research assistant professor in the Department of Physical Medicine and Rehabilitation at the University of Michigan Medical School.

The study's corresponding author was Paul M. Gordon, Ph.D., M.P.H, who is a Professor at Baylor University in Texas. Gordon suggests that strengthening activities may be equally important to physical activity

participation.

The research is based on data from the Cardiovascular Health Intervention Program (CHIP), a study of sixth graders from 17 mid-area Michigan schools between 2005 and 2008.

Participants were tested for strength capacity using a standardized handgrip strength assessment, which is recently recommended by the Institute of Medicine (IOM). Researchers also measured cardiorespiratory fitness – how well the body is able to transport oxygen to muscles during prolonged exercise, and how well muscles are able to absorb and use it.

The study is one of the the first to show a robust link between strength capacity and a lower chance of having diabetes, heart disease or stroke (cardiometabolic risk) in adolescents, after controlling for the influence of BMI, physical activity participation, and cardiorespiratory fitness.

"The stronger you are relative to your body mass, the healthier you are," Peterson says. "Exercise, sports, and even recreational activity that supports early muscular strength acquisition, should complement traditional weight loss interventions among children and teens in order to reduce risks of serious diseases throughout adolescence."

Previous, large-scale studies have found low muscular [strength](#) in teen boys is a risk factor for several major causes of death in young adulthood, such as suicide and cardiovascular diseases.

More information: "Strength Capacity and Cardiometabolic Risk Clustering in Adolescents," *Pediatrics*, March 31, 2014, [DOI: 10.1542/peds.2013-3169](https://doi.org/10.1542/peds.2013-3169)

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