

Study suggests light physical activity as a child is key to reducing risk of type 2 diabetes

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Increased sedentary time from childhood is associated with a significant increase in blood insulin concentration and therefore the risk of type 2 diabetes, a new study has found.

The research, conducted by the University of Exeter in collaboration with the University of Bristol and University of Eastern Finland, has also discovered light [physical activity](#) could reduce the risk of excess insulin and insulin resistance. The paper, titled "[The Interactive Effects of](#)

[Sedentary Time, Physical Activity, and Fat Mass on Insulin Resistance in the Young Population.](#)" was published in the *Journal of Clinical Endocrinology and Metabolism*.

Professor Andrew Agbaje of the Children's Health and Exercise Research Center at the University of Exeter said, "Childhood sedentariness is a monster that threatens the young population across the globe, no thanks to excessive screen use. Sedentariness should be recognized as one of the independent causes of excess insulin, fat obesity, high lipid levels, inflammation, and arterial stiffness.

"Three to four hours of light physical activity per day is critically important to tackling childhood sedentariness. While we await the update of the current World Health Organization's physical activity guidelines, which does not include a light physical activity recommendation, [public health experts](#), health policymakers, health journalists, pediatricians, and parents should encourage kids to participate in daily light physical activity."

Based on the University of Bristol's Children of the 90s data, the study included 792 children followed up from 11 to 24 years of age. At baseline they spent an average of six hours per day in sedentary activities, which increased to nine hours per day during the follow-up. This increase in [sedentary time](#) was associated with continuously higher insulin levels, especially among overweight and obese youths, whose risk of excess insulin increased by 20%.

In contrast, increasing and maintaining light physical activity from childhood decreased the risk of excess insulin by 20%. Higher light physical activity was also associated with lower insulin resistance. Participating in moderate-to-vigorous physical activity showed signs of reducing insulin, but to a much smaller extent.

Earlier results from the same cohort have linked sedentariness to fat obesity, dyslipidemia, inflammation, and premature vascular damage. The researchers have also observed a vicious cycle of obesity and worsening insulin resistance.

Light physical activity is now emerging as an effective approach to reversing the harmful effect of childhood sedentariness. However, whether long-term exposure to light physical activity from childhood reduces excess glucose, insulin, and insulin resistance has not been examined before. This is because only a few studies have repeatedly measured sedentariness, light physical activity, and insulin in a large population of healthy youth.

The current study is the largest and the longest follow-up accelerometer-measured movement behavior and glucose, insulin, and [insulin resistance](#) study in the world. The participants wore accelerometer devices on their waists at ages 11, 15, and 24 for four to seven days and had fasting glucose and insulin measurements at ages 15, 17, and 24.

Their fasting blood samples were also repeatedly measured for high-density lipoprotein cholesterol, low-density lipoprotein cholesterol, triglycerides, and high-sensitivity C-reactive protein. Blood pressure, [heart rate](#), smoking status, socio-economic status, and family history of cardiovascular disease were controlled for in the analyses.

More information: Andrew O Agbaje, The Interactive Effects of Sedentary Time, Physical Activity, and Fat Mass on Insulin Resistance in the Young Population, *The Journal of Clinical Endocrinology & Metabolism* (2024). [DOI: 10.1210/clinem/dgae135](https://doi.org/10.1210/clinem/dgae135)

Provided by University of Exeter

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