

Children with high BMI who don't become obese adults do not appear to be at increased risk of type 2 diabetes

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New research being presented at this year's European Congress on Obesity (ECO) in Glasgow, UK (28 April-1 May) suggests that having a high BMI in childhood coupled with obesity in adulthood may contribute to the development of type 2 diabetes. However, children with a high BMI who did not have obesity as adults do not appear to be at greater risk of type 2 diabetes when they grow up.

The meta-analysis of 10 Danish and Finnish cohort studies following more than 25,000 children between 1978 and 2016, found that these associations were not influenced by educational and lifestyle factors suggesting that body mass index (BMI) affects the risk of developing type 2 diabetes in the same way irrespective of your education attainment, level of [physical activity](#), or smoking status.

Obesity in childhood and adulthood is already known to be a strong risk factor for type 2 diabetes, but disease risk is also influenced by other factors including age, sex, ethnic differences, and genetic factors which can affect the likelihood of developing type 2 diabetes independently of an individual's BMI. But little is known about whether associations between changes in BMI and type 2 diabetes vary by socioeconomic and lifestyle factors.

In this study, Dr. Lise Bjerregaard from Bispebjerg and Frederiksberg Hospital in Denmark and Danish and Finnish colleagues investigated the

relationship between change in weight status from childhood to adulthood and the development of type 2 diabetes in 25,291 children who had BMI measured in both childhood (at ages 7 and 12 years) and in adulthood (20-71 years). They also examined whether these associations were independent of, or modified by, sex, educational attainment, smoking, and physical activity.

In children, BMIs were categorised using age- and sex-specific cut-offs with high BMI defined as more than the 85th BMI percentile. In adults, BMIs were categorised as obese (more than 30 kg/m²) or non-obese (equal to or less than 30 kg/m²). 2360 children went on to develop type 2 diabetes between the ages of 30 and 85 years.

Analyses showed that girls with high BMI at aged 7 and obesity as adults were five times more likely to develop type 2 diabetes compared with girls who were [normal weight](#) at 7 years and not obese as adults. Similarly, boys with a high BMI at 7 years who had obesity as adults were at nearly four times greater risk of type 2 diabetes compared to those who were normal weight at 7 years and not obese as adults.

In contrast, children with a high BMI at age 7 who did not have [obesity](#) as [adults](#) had no increased risk of type 2 diabetes.

Adjusting for other known risk factors for type 2 diabetes including education, smoking, and leisure-time physical activity did little to change the results.

"What our findings suggest is that irrespective of socioeconomic and [lifestyle factors](#) such as smoking, a sedentary lifestyle, or lower [educational attainment](#), a high BMI in childhood was associated with increased risks of developing type 2 diabetes only if it continued to adulthood", says Dr. Bjerregaard.

"Therefore, public health initiatives should focus on preventing excess weight gain irrespective of these factors. Individuals of all levels of education and physical activity may benefit from health promoting interventions."

The authors caution that their study wasn't designed to find or measure a direct cause and effect relationship between being overweight/obese long-term and a higher risk of type 2 diabetes, but rather to shed light on possible relationships between the two. They also note that they used BMI as an indicator of adiposity, so it is not known whether the changes in the risk of type 2 diabetes are due to changes in lean mass or fat mass, or the location of the fat mass. Additionally, the sample size in some groups may have been too small to show effect modifications—although this reflects that these groups were at risk of developing type 2 [diabetes](#).

Provided by European Association for the Study of Obesity

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