Is it possible to be healthy and obese?

The causes of the global obesity crisis are not fully understood, but stress may have a part to play, new research suggests

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Does stress make you fat, even if you don’t overeat? That is the question researchers from UCL have been trying to answer by giving volunteers of different shapes and sizes a haircut and measuring levels of the stress hormone [cortisol](http://www.yourhormones.info/Hormones/Cortisol.aspx) in their hair. Long-term stress raises cortisol levels, and the researchers found that the larger volunteers had higher levels in their hair. So does this mean we can attribute obesity to stress and, if so, what can we can do about it?

The idea itself isn’t new. Cortisol is produced by the adrenal glands that sit on top of the kidneys. It plays a vital role in keeping glucose levels in the bloodstream in a steady state. When we are stressed or threatened, cortisol levels rise to release more glucose from stores in the liver, so we have more fuel to fight or run for our lives. Too much cortisol means too much glucose floating around and if it doesn’t get used, the excess is stored as fat.

But it has been hard to measure long-term cortisol levels reliably because they fluctuate over time. Traditionally, they have been measured in blood, urine or saliva but this new study used hair cut as close to the scalp as possible to measure accumulated levels over a two-month period. Researchers found that obese individuals with a BMI in excess of 30, or waist circumference above 102cm (40in) in men and 88cm (35in) in women, had the highest cortisol levels. [Dr Sarah Jackson](https://www.ucl.ac.uk/iehc/research/behavioural-science-health/people/staff/jackson), of UCL’s Institute of Epidemiology and Health Care, explained: “People who had higher hair cortisol levels also tended to have larger waist measurements, which is important because carrying excess fat around the abdomen is a risk factor for heart disease, diabetes, and premature death.”

Yet there are important unanswered questions; does this research, carried out in white, over-50’s, mostly male volunteers, apply to other groups? Is the raised cortisol a cause or an effect of obesity? Will lowering levels prove an effective treatment? And will we ever be able to stem the [rising tide of obesity](http://www.who.int/mediacentre/factsheets/fs311/en/)? Furthermore, is it actually that bad to be fat? [Some might point to a study](http://jamanetwork.com/journals/jama/fullarticle/2520627)showing that older people who are overweight (BMI 25-30) live longer than those of normal weight and that the optimal BMI is 27. What they don’t say is that many of those will tip into being obese (a BMI of more than 30) as time goes on. And few would deny that [extreme obesity is bad for health](https://www.noo.org.uk/NOO_about_obesity/adult_obesity/UK_prevalence_and_trends); not only do you die younger, but there is the discomfort, chafing, difficulty walking, having sex and medical problems such as diabetes to put up with.

It is possible to be obese and healthy; just like it’s possible to smoke and not have lung cancer. Genes may explain why some people are obese and healthy, while others develop diabetes and heart disease. [Professor Haja Kadarmideen](http://forskning.ku.dk/find-en-forsker/?pure=da/persons/402160), a geneticist at the University of Copenhagen, has identified three genes that seem to influence whether fat is compartmentalised and stored around the outside of the body on hips, thighs and arms, or whether it spills into the circulatory system, causing diabetes and fat deposits around internal organs such as the heart and liver.

But [Professor John Mathers](http://www.ncl.ac.uk/hnrc/people/profile/john.mathers), of Newcastle University, says that when it comes to obesity, “Genetics is not as important as we thought. A few individuals who are obese will have an inherited condition such as [Prader-Willi syndrome](https://www.pwsa.co.uk/diagnosis/about-pws-new.html" \o ") [causing weak muscle tone, developmental delay and an inability to control appetite]. But most plump people you see on the high street don’t have a particular genetic tendency to account for their obesity.”

Mathers explains that genes mostly act on pathways in the brain that influence appetite and satiety. It may seem, for instance, that all the children in a family are eating the same, but they are almost certainly not: it is notoriously hard to accurately rate how much you yourself eat, let alone how much a child is eating. In fact, he says, researchers increasingly use objective measures of food intake andenergy expenditure and rely less on self-reported food diaries. Interestingly, lean people tend to be better at accurately reporting their intake whereas overweight people are much more likely to underestimate how much they eat.

But is it a question of how much we eat – or what we eat? Professor Tim Spector, of King’s College London, says that to avoid obesity, [we need to nurture a healthy gut](https://www.theguardian.com/lifeandstyle/2016/aug/01/is-your-gut-making-you-sick) biome (the genes in the millions of bacteria, viruses and fungi that live in our gut). We don’t consume more calories or do much less than previous generations, yet people around the world are getting fatter, and Spector thinks it is because we are not looking after our biomes. That means eating a range of fibre and vegetables, including artichokes, leeks, onions and garlic. Polyphenols in nuts, seeds, coffee, dark chocolate, red wine, olive oil and berries provide energy for microbes, while pre and probiotics that boost or contain microbes include yoghurt, sauerkraut, kimchi and miso.

Jackson says that the link between stress, cortisol and obesity is interesting but not fully understood. “We don’t know what comes first. Does being overweight make you stressed, which in turn raises cortisol? Or does stress raise cortisol, which makes you fat?” In time, drug treatment to lower raised cortisol may be used to treat obesity. But for now, she says, recognising a link between stress and obesity means there is a case for teaching stress management techniques to everyone. Mathers, meanwhile, says the answer to curbing obesity lies in creating buildings, streets and outdoor spaces that encourage activity. Government measures to cut the sugar content of food and drink are a start, but not the whole story. “There’s no point blaming individuals. We got into this mess because of the society we’ve created,” he says.