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Exercise is not really the solution to obesity and weight loss - study

A new collaborative global study involving two University of Cape Town (UCT) academics has nullified the long-held view that exercise is the solution to obesity and weight loss. The researchers, instead, found that that energy balance is more complicated than simply calories in, calories out.

Professor Lara Dugas, AXA Research Chair in Non-Communicable Disease Epidemiology in the Division of Epidemiology & Biostatistics at UCT's School Public Health & Family Medicine, and Professor Vicki Lambert, director of Health through Physical Activity Lifestyle and Sport Research Centre (HPALS), Department of Human Biology, also at UCT, are two researchers contributing to this new landmark study.

"Previously, the way we have approached obesity treatment is to tell people to move more. That has been the standing mantra for the last 20 years," says Dugas. "But often people don't get the results that they deserve. We're now starting to understand that the relationship between increasing daily physical activity and your resultant body weight is not that simple."

In a paper titled *Energy compensation and adiposity in humans* that was recently published in *Current Biology*, Dugas and colleagues from across the globe set out to explore whether increased activity energy expenditure (AEE) does indeed translate into an increase in total energy expenditure (TEE) per day. In simple terms, does increased exercise necessarily result in burning more calories per day for weight loss to occur, as we have been told?

Using data collected from more than 360 studies conducted over the past three decades, the researchers looked at the relationship between TEE and basal energy expenditure (BEE) or basal metabolic rate in 1 754 individuals living normal lives. What they found is that the human body compensates for increased AEE by reducing BEE.

"Energy compensation by a typical human may average around 28% due to reduced BEE; this suggests that only 72% of the calories we burn from additional activity translates into extra calories burned that day."

What's more, energy compensation varies considerably between people of different body compositions.

"The studies are showing that for very obese people, people with a body mass index of 35 or more, the compensation can be up to 50%, which means that some people may be lowering their basal metabolic rate by about 50%. That's a lot," says Dugas.

In other words, often, when obese people are put on rigorous exercise regimes to lose weight, their body compensates for the increased AEE with a significant depression in their basal metabolic rate. "This makes it even more difficult for them to lose weight or even maintain that lost weight," adds Dugas.

The balance of food with exercise

Although it may be tempting to misread the paper and write exercise off as useless in the pursuit of weight loss and a healthy lifestyle, Dugas is quick defend its value.

"The evidence is very clear: people who are more physically active and have more cardio-respiratory fitness generally live longer and have a better quality of life," she says. "Exercise remains the number one predictor of overall mortality. So, we're not saying no to exercise."

Instead, what the study is strongly advocating for is a greater emphasis on the balance between energy intake and expenditure.

"We now have evidence as to why telling someone who is obese to only start exercising does not result in the expected weight loss," says Dugas. "Certainly, this supports a multi-pronged approach when it comes to treating obesity. We have to bring the conversation around to the impact of the food environment with the exercise environment."

Importantly, the study also sets the stage for a growing understanding of the causal relationship between energy compensation and adiposity, which could be key deploying exercise more successfully in the fight against the growing obesity epidemic.

Research method

This study is a result of an international collaboration hosted by the International Atomic Energy Agency's (IAEA) doubly labelled water (DLW) database, which contains data for 1 754 individuals.

Dugas explains that the human body is unable to detect the difference between regular water and DLW, which within five hours, mixes and equilibrates with the normal water in the body. "If I take urine sample every other day over the next 10 days, it is possible to analyse the urine sample to measure how much of it is regular body water, or how much of it is the special DLW," she says. "The faster your metabolic rate, the faster your total body water turns over, which means that you initially there will be higher concentrations of the DLW in your urine."

"This allows us to very accurately tell you what your energy expenditure is just by looking at the appearance of that water in your urine, because total body water turnover can be used to estimate energy expenditure."

To measure BEE, participants are placed under a metabolic hood that measures how much energy is being burned while at rest.

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