Exercise may or may not help you lose weight and keep it off—here's the evidence for both sides of the debate

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The global fitness industry will generate over US$80 billion in revenue in 2023, estimates suggest. And why not, given the many excellent

reasons to exercise? Better cardiovascular health, lower risk of Type 2 diabetes, stronger immune system—the list goes on.

One of the biggest reasons many people choose to exercise is to lose weight. As a biobehavioral scientist, I study links between behavior and health, and I heed the time-honored advice that eating less and exercising more are necessary to lose weight. But a recent debate in the scientific community highlights the growing suspicion that the "exercising more" part of this advice may be erroneous.

At the center of the debate is the constrained total energy expenditure hypothesis, which asserts that exercise won't help you burn more calories overall because your body will compensate by burning fewer calories after your workout. Thus, exercise won't help you lose weight even if it will benefit your health in countless other ways.

Obesity researchers take issue with this hypothesis, because it's based on observational research rather than randomized controlled trials, or RCTs, the gold standard of scientific evidence. In RCTs, participants are randomly assigned to either a treatment or a control group, which allows researchers to determine whether the treatment causes an effect. Randomized controlled trials have shown that exercise causes weight loss.

The verdict is actually more mixed when considering all the gold-standard evidence available.

What the evidence says

Spectators of this hypothesis have emphasized the importance of systematically reviewing the evidence from all gold-standard trials. They pointed to a 2021 review of more than 100 exercise studies that examined the effect on weight loss in adults of aerobic, resistance or

high-intensity interval training in combination or alone. The review concluded that supervised exercise regimens do cause weight loss, even if only a modest amount.

So that settles the debate, yes? If you eat too much dessert, then you can just go on an extra run to burn off those extra calories, right?

Well, not exactly.

If extra physical exertion burns extra calories overall, then exercise should also keep the weight from coming back after low-calorie dieting. But keeping those lost pounds off after dieting is a common challenge. The same 2021 review includes the few randomized controlled trials that address the question of whether exercise facilitates weight maintenance. However, the results weren't as good as they were for weight loss. The researchers found that six to 12 months of aerobic exercise, resistance training or both after dieting did not prevent weight regain in adults.

Exercise adherence

But what about compliance? Did all the people in those studies actually exercise regularly?

The 2021 review found only one randomized controlled trial on weight maintenance that reported an objective compliance rate, meaning each exercise session was supervised by a trainer. This tells us the percentage of time that participants in the study actually exercised as prescribed.

In that trial, the compliance rate was only 64% for 25 post-menopausal women who completed a resistance training program after diet-induced weight loss. This was for a regimen in which participants had to come in and exercise two to three times per week for an entire year. From the perspective of keeping up with a program for that long, doing so 64% of

the time doesn't seem so bad.

But they still gained back as much weight as the 29 women in the control group who were not enrolled in the exercise program.

Energy balance

Many people would say that it's all about balancing energy in from food and energy out from exercise. If exercise didn't keep the weight off, then maybe a bigger dose of exercise was needed.

The American College of Sports Medicine highlighted this issue of exercise dose in its 2009 position statement on physical activity for weight maintenance, stating that the amount of physical activity needed for weight maintenance after weight loss is uncertain. Moreover, it stated that there is a lack of randomized controlled trials in this area that use state-of-the-art techniques to monitor the energy balance of participants.

Fortunately, some of the authors of the position statement went on to use state-of-the-art techniques to monitor energy balance in their own randomized controlled trial. In 2015, they enrolled overweight adults into a 10-month aerobic exercise program and compared the energy intake of those who lost weight with the energy intake of those who didn't lose weight while on the program. They found that those who didn't lose weight were indeed taking in more calories.

Mystery of the disappearing calories

But there's something else in that 2015 study's energy measurements that is quite interesting. By the end of the study, the number of total daily calories the exercisers burned was not significantly different from what the nonexercisers burned. And this was in spite of the fact that trainers

verified the exercisers burned an extra 400 to 600 calories per session at their nearly daily exercise sessions. Why didn't those extra exercise calories show up in the total daily calories burned?

The answer to that question may help explain why exercise doesn't always help you keep the weight off: Your metabolism responds to regular exercise by decreasing the number of calories you burn when you're not exercising. That's according to the constrained total energy expenditure hypothesis that spurred the current debate.

Researchers recently tested the hypothesis by measuring the nonexercise calorie burn of 29 obese adults over a nearly 24-hour period, both before and after a six-month exercise program. They found that the calories they burned when they weren't working out did decrease after months of regular exercise—but only in those who were prescribed the higher of two different exercise doses.

Those who exercised at the lower dose for general health, meaning they burned an extra 800 to 1,000 calories per week, saw no change in their metabolic rate. But those who exercised at the higher dose to lose weight or maintain weight loss, meaning they burned an extra 2,000 to 2,500 calories per week, had a decrease in their metabolic rate by the study's end.

Exercise for health

Perhaps both sides of the debate are right. If you want to lose a modest amount of weight, then a new exercise routine might make a modest contribution toward meeting that goal.

However, as others have said, don't fool yourself into thinking you can "outrun a bad diet" by simply exercising more. There is a diminishing marginal return to exercise—you eventually take less weight off for the

additional exercise you put in.

But even if extra exercise might not help you lose weight and keep it off, there are still the other great health dividends that regular exercise pays out.

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