

Can You Outrun a Bad Diet?

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From the time our mothers told us as kids to eat our vegetables and our middle-school physical education teachers told us to run up and down the basketball court, we have known that vegetables and exercise are good for us. Nutrition and exercise are inextricably linked to our body weight, health, and even our mortality. However, people tend to think that what goes into one's mouth is more important than running around the block.

People believe what they want to believe, and no amount of contrary evidence changes that. Factor in the misinformation on the Internet and social media by self-proclaimed experts, and that causes a conundrum that would leave anyone confused.

Even William Shakespeare, who was not a scientist, knew this. As he spoke through Hamlet in his famous “to be or not to be” soliloquy: *“And makes us rather bear those ills we have than fly to others that we know not of? Thus conscience doth make cowards of us all.”*

We are all cowards, afraid of the unknown, which makes us more likely to hold onto the knowledge and ideas we have than to face new knowledge and new ideas.

But Shakespeare could not have been talking about scientists, because scientists are supposed to be different. Scientists thrive on the unknown and, through the scientific method, discover and face something new.

When people say you can't outrun a bad diet, they're suggesting that diet has a greater impact than does the fitness gained from exercise, and that the fitness gains can't overcome the deleterious effects of poor food choices or overconsumption of calories. But that's simply not true. We can indeed outrun a bad diet. And we can do it from several perspectives, including body weight, health, and mortality.

Body Weight

It is true that diet (specifically, caloric restriction) is more effective than exercise for losing weight (1,2). Calorie restriction reduces the number of daily calories consumed, and in so doing guarantees that a calorie deficit is maintained. Although some research has shown that manipulations of macronutrients can lead to short-term weight loss (e.g., low-carbohydrate, high-protein diets), “calories in versus calories out” still remains the critical factor for body weight. In long-term studies,

there is a clear and highly significant relationship between the number of calories ingested and weight gain and body fat storage, with limited individual differences (3). Exercise typically causes only small losses in body weight, falling short of what is considered clinically significant (4).

However, exercise alone, even without changes in diet, can cause a significant weight loss, as well as significant decreases in fat mass, although it takes around 225 to 420 min·wk⁻¹, or enough to burn at least 2,000 calories per week (5)—an amount that exceeds current guidelines set by ACSM and the U.S. Department of Health and Human Services for general health and fitness (6).

The fact that it takes a lot of exercise to burn the calories consumed in seconds with a single donut or slice of pizza often leads the public and even fitness professionals and nutritionists to argue that one cannot outrun a poor-quality diet or the overconsumption of calories. However, since most people who lose weight gain it back, weight-loss strategies must be evaluated on their merits over the long term. When we consider this, exercise is particularly important for weight maintenance (both after losing weight and for never becoming overweight in the first place), with less weight regain and more favorable changes in body composition when exercise accompanies diet compared with diet alone, regardless of the type of diet (7,8)). And, contrary to diet-focused weight loss that includes a loss of muscle mass, exercise attenuates the loss of (and can even increase) lean mass when losing weight.

Health

When it comes to health, while both diet (specifically, caloric restriction) and exercise are good for one's cardiometabolic health, higher levels of fitness are more strongly associated with a reduced risk of metabolic syndrome than is a healthy diet. Indeed, low cardiovascular fitness is such a strong risk factor for metabolic syndrome that not even a healthy diet can diminish the risk (9). Aerobic exercise also prevents or mitigates the decline in blood vessel endothelial function caused by overconsuming sugar and high-fat or fast-food meals (10,11). Exercise, in modest amounts, is even a more potent guard against the common cold and other upper respiratory tract infections than is nutrition (12).

Despite the heavy attention the media gives to diet, being unfit with a good diet is much worse for one's health than being fit with a bad diet. In the face of a lower-quality diet—perhaps one that includes donuts and lacks vegetables—exercise mitigates and, in some cases, even erases its effects, reducing one's

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risk of disease. This occurs, in large part, because exercise makes one fitter. No diet, supplement, or nutritional intervention has been proven to improve fitness. And the more fit one is, the lesser the risk of developing the metabolic risk factors that cause heart disease and diabetes, regardless of what is on one's dinner plate.

Mortality

Although eating donuts and French fries increases one's risk of death when such foods are part of a dietary pattern, when one is very fit, the relation between unhealthy eating and mortality is attenuated to the point that it is no longer significant (13). While a poor diet is a *modest* predictor of all-cause mortality after considering fitness level, with the mortality risk modestly increasing when going from a good diet to a poor diet, fitness is a *strong* predictor of all-cause mortality after considering diet, with the mortality risk dramatically increasing when going from high to low fitness level (13). Many studies, reviews, and meta-analyses have found that being physically fit significantly reduces one's chance of death from all causes to a much greater degree than does a healthy diet (14,15). Although there is a strong genetic component to fitness and to the extent to which people adapt to exercise, increasing physical activity increases fitness in nearly all people. With few exceptions, increasing physical activity is associated with a 15% to 50% reduction in all-cause mortality and a 15% to 40% reduction in cardiovascular disease mortality (16). Research on the joint associations of BMI and cardiovascular fitness on all-cause and cardiovascular disease mortality have shown that cardiovascular fitness is a stronger predictor of death than is obesity and that individuals with obesity who exercise have lower morbidity and mortality than normal-weight individuals who are sedentary (17,18). It's better to be fat and fit than to be thin and unfit.

For a small thought experiment, let's take two people off the street—Sam and Sally. Sam eats a clean, nutrient-dense diet full of vegetables, fresh fruit, kale, and salmon, but he sits on the couch and binge-watches Netflix movies every day. Sally, on the other hand, eats whatever she wants, including donuts, pizza, fast-food cheeseburgers, and French fries, but she exercises daily, including running a few miles, taking high-intensity cardio classes, and lifting dumbbells and barbells at the gym. After 6 months or 10 years, who will have a more stable, healthier body weight, less body fat, cleaner arteries, less inflammation, a stronger immune system, and less risk of cardiovascular disease, and who is going to be physically fitter?

While future research needs to untangle the combined effects of nutrition and exercise, especially concerning their molecular responses and how they influence body weight, health, and mortality, the available evidence clearly shows that the potency of exercise can overcome poor or suboptimal nutrition and is

the best thing one can do for long-term weight maintenance and health and to defend against premature death. Understanding this can help direct initiatives and policies regarding exercise and nutrition programs, from elementary schools all the way up to national governments.

The author has published a book on the subject of this Invited Commentary.

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