

Genetic factors may affect exercise benefit

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Resistance exercise has well-known health benefits, but the magnitude of those benefits may differ according to an individual's genetic make-up. Women with a high genetic risk of obesity may benefit less from resistance exercises than those at a lower genetic risk, according to research published in the *International Journal of Obesity*.

"With the recent identification of body mass index–associated genetic variants, it is possible to investigate the interaction of these genetic factors with exercise on body composition outcomes," said lead researcher Yann Klimentidis, assistant professor of epidemiology at the University of Arizona's Mel and Enid Zuckerman College of Public Health.

Klimentidis and colleagues analyzed [genetic markers](#) of 148 women between the ages of 30 and 65 years old who participated in a yearlong randomized trial called the Bone Estrogen and Strength Training, or BEST, study. During the trial, 84 participants were asked to engage in supervised, high-intensity resistance training and moderate-impact, weight-bearing exercises for 75 minutes, three days a week, for 12 months.

During the trial, participants were asked to take calcium supplements, but not to change their diet otherwise, and dietary intake was recorded at random intervals. A genetic risk score for obesity for each participant then was calculated based on 21 genetic markers thought to affect body weight. The authors found that participants with a low genetic risk score for obesity benefited most from the exercise regimen, at least when it came to weight and body composition outcomes. This included a reduction in weight, total and percentage body fat, and abdominal fat.

"This doesn't mean that resistance training is futile for women with higher genetic risk for obesity. It means those with lower genetic risk just benefited more," explains Jennifer Bea, assistant professor at the UA College of Medicine – Tucson. "We have previously shown that the [resistance training](#) was important for these women in many other ways, including improved bone density. Like most interventions, exercise is not a one-size-fits-all proposition. People with higher genetic risk scores for higher BMI may benefit more from aerobic training, for example."

The study found weight-loss response to [resistance exercise](#), including changes in [body composition](#), differs according to an individual's [genetic risk](#) for obesity.

The authors suggest that further studies in other populations be undertaken, with a focus on other health-related outcomes using other genetic variants. Further research also is needed to identify the molecular and physiological mechanisms that these genes are involved in, and to determine optimal weight-management strategies based on an individual's genetic profile.

More information: High genetic-risk individuals benefit less from resistance exercise intervention, *International Journal of Obesity* accepted article preview 30 April 2015; [DOI: 10.1038/ijo.2015.78](https://doi.org/10.1038/ijo.2015.78)

Provided by University of Arizona

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