

Researcher spotlights the benefits of resistance training

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The immense physical and mental benefits of exercise are undeniable across the board, but UNM's College of Education & Human Sciences (COEHS) isn't stopping there.

In the Department of Health, Exercise & Sports Sciences, researchers like Flavio de Castro Magalhaes, assistant professor of Exercise Sciences and director of the Exercise Physiology Lab are pushing forward into that cause and effect.

"My interest in [exercise science](#) began when I was a teenager. I always tried to exercise as much as I could, and I played soccer back in Brazil. When I got to my undergraduate course, in [physical education](#), I got interested in [exercise physiology](#) and in resistance [training](#) in general," Magalhaes said.

Magalhaes is uncovering new connections between resistance training and [insulin resistance](#). Before understanding why this connection is so critical, Magalhaes highlights the beneficial role of resistance training in general.

"Resistance training is a type of exercise training that uses an external resistance for your muscles to forcefully contract against it, usually done with only a few repetitions and with a high degree of effort," he said. "Adaptations usually include, of course, increasing strength and increasing your muscle size—what we call hypertrophy."

Pushing up, back, forward, down—no matter the direction—while having a weighted resistance against your body promotes endurance, strength and muscle mass.

"Resistance training, also known as strength training, can also be good for your health in general. It can reduce your blood pressure. It can be good for anxiety, for depression, for functioning in general and for treating and actually preventing Type 2 diabetes," Magalhaes said.

While resistance training also helps flexibility, posture and joints, Magalhaes focuses on [insulin sensitivity](#) and resistance. It's all

connected, too.

"I use resistance training in my research to try to understand how it can improve one aspect of your health, which is [insulin](#) resistance—the opposite of insulin sensitivity. When people usually get sick, or when they get metabolic problems, they get insulin resistant," Magalhaes said. "If they are insulin resistant, this predisposes them to become pre-diabetic and eventually Type 2 diabetic, and what I do is use resistance training to try to prevent that."

Magalhaes began his study in Brazil, where he recruited 15 individuals at risk for insulin sensitivity. These participants were over 35 and moderately to severely obese.

"We use participants that are at high risk for developing insulin resistance or already are insulin resistant. They have central obesity as well, which means that they have more fat stored around the waist mainly. Those characteristics predispose them to be more likely to have insulin resistance and to develop that into Type 2 diabetes," he said.

Each participant had an established base, coming into the gym space for a control day, where no activity was performed. This was also checked the day after the exercises to see if a change in insulin was noticeable.

"We have to actually familiarize them for a few days before they actually do the testing. They get familiarized, we perform the exercises, and the next morning we test them. They do show better insulin sensitivity, so that's pretty amazing for us to see," Magalhaes said.

The real work both on behalf of the researcher and the participant comes with the resistance exercises. Magalhaes chose each to provide a well-rounded, resistance-based routine that could be done repeatedly and quickly.

"It's a workout composed of what we call a whole body workout. We try to target the main major muscle groups in the body. That's the legs and the upper body in general. We ask them to try to get as close as possible to a high degree of effort," he said.

There are seven exercises, conducted in three varying weight sets to make up a total of 21 total exercises. Magalhaes emphasizes they are not only easy to find, but easy to complete.

"Most of the time, people will tell you that they don't have time to exercise. That's a good excuse, but when you're diving to the actual reasons you end up seeing they think that they are not able to do the amount of exercise or type of exercise they're supposed to do," said Magalhaes.

"We are using exercises that target the whole body. It's very simple, very straightforward, and are exercises that we can find in regular gyms," he said.

The exercises include:

- Deadlifts
- Bench press
- Shoulder press
- Chest press
- Leg press
- Leg curls
- Leg extension

After a set of each exercise, the next round will include slightly more weight; more weight equals more resistance and more benefit.

"There's not as many variations, but it's possible to do at home. We don't

need that much space, so I think it's important for people to know that if they don't like [aerobic exercise](#), they can do resistance training and still observe improvements in their health," Magalhaes said.

Aside from the already clear health benefits, Magalhaes is incredibly passionate about the exercises' other advantages: they are not static and not time-consuming.

"I think it's important for people to know they have options. Aerobic exercise might not be the best option, so I want to be able to provide people with other types of exercise—in this case, resistance exercise—so they can have options when it comes to choosing what they prefer to improve their health," he said.

Although a full analysis of the results has not yet been completed, early examinations show a positive impact on insulin resistance.

"The data looks pretty good. It helps show that resistance training is beneficial to insulin or insulin resistance," Magalhaes said.

In addition, the participants also had their own positive impact to report. In a confidence evaluation, those who completed the exercises felt more confident about themselves, and their ability to be active moving forward.

"They had to rate their confidence, what we call self-efficacy, which is the belief that they can do something, and it went up. By showing them that they can do resistance-type exercise and improve their health, they felt more confident, like they could be able to continue doing that," Magalhaes said.

At the end of the day, there is nothing wrong with aerobic exercise. Years of studies have shown the benefits of what a few jumping jacks or

a run on the treadmill can do for your body. Those improvements for your well-being still exist, but Magalhaes believes the same gains can come from [resistance training](#).

"The majority of research has been focusing on the effect of aerobic exercise when it comes to improving your health. Resistance exercise has been put aside, and I want to be that middle," Magalhaes said. "I want to show you can use [resistance](#) exercise, which traditionally has been used to get stronger and get bigger muscles, to improve your health. People might not be interested in doing aerobic exercise."

Still, if you're still not into these options, just remember that any [exercise](#) is good.

"I think that it's very clear that in the last 80 to 100 years, we've seen a dramatic increase in health problems related to sedentary and to dietary choices. That leads to obesity and obesity-related problems. I think my main goal is to try to provide people with options," Magalhaes said.

Provided by University of New Mexico

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