

Resistance Exercise May Be Best Workout for a Good Night's Sleep

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A randomized trial suggests resistance exercise promotes better sleep than other workouts among inactive adults, particularly those who are poor sleepers.



Angelique Brellenthin

"We thought resistance exercise would be somewhere in the same neighborhood as aerobic exercise or that maybe combined exercise would be a little bit better but, no, it was consistently resistance exercise, on its own, that seemed to show the most benefits across the board," Angelique Brellenthin, PhD, told *theheart.org* | *Medscape Cardiology*.

The results were presented at the recent [Epidemiology, Prevention/Lifestyle & Cardiometabolic Health \(EPI|Lifestyle\) 2022](#) conference sponsored by the American Heart Association (AHA).

Even before the pandemic and bedtime "doom scrolling" took hold, research showed that a third of Americans regularly get less than 7 hours of sleep. The AHA recommends aerobic exercise to improve sleep and promote cardiovascular health, yet little is known on how it compares with other types of exercise in the general population, she said.

Brellenthin and coinvestigator Duck-chul Lee, PhD, both of Iowa State University in Ames, recruited 406 inactive adults, aged 35 to 70 years, who were obese or overweight (mean body mass index, 31.2 kg/m²) and had elevated or stage 1 hypertension and randomly assigned them to no exercise or 60 minutes of supervised aerobic, resistance, or combination exercise three times per week for 12 months.

The aerobic exercise group could choose among treadmills, upright or recumbent bikes, and ellipticals, and had their heart rate monitored to ensure they were continuously getting a moderate- to vigorous-intensity exercise.

The resistance exercise group performed three sets of eight to 16 repetitions at 50% to 80% of their one-rep maximum on 12 resistance machines: a leg press, chest press, lat pulldown, leg curl, leg extension, biceps curl, triceps pushdown, shoulder press, abdominal crunch, lower back extension, torso rotation, and hip abduction.

The combination group did 30 minutes of aerobic exercise at moderate to vigorous intensity, and then two sets of eight to 16 repetitions of resistance exercise on nine machines instead of 12.

Exercise adherence over the year was 84%, 77%, and 85%, respectively.

Participants also completed the Pittsburgh Sleep Quality Index (PSQI) at baseline and 12 months. Among the 386 participants (53% women) with evaluable data, 35% had poor-quality sleep, as indicated by a global PSQI score of more than 5, and 42% regularly slept less than 7 hours per night.

In adjusted analyses, sleep duration at 12 months, on average, increased by 13 minutes in the resistance-exercise group ($P = .009$), decreased by 0.6 minute in the aerobic-exercise group, and increased by 2 minutes in the combined-exercise group and by 4 minutes in the control group.

Among participants who got less than 7 hours of sleep at baseline, however, sleep duration increased by 40 minutes ($P < .0001$), compared with increases of 23 minutes in the aerobic group, 17 minutes in the combined group, and 15 minutes in the control group.

Overall sleep efficiency, or the ratio of total sleep time to time in bed, improved in the resistance ($P = .0005$) and combined ($P = .03$) exercise groups, but not in the aerobic or control groups.

Sleep latency, or the time needed to fall asleep, decreased by 3 minutes in the resistance-exercise group, with no notable changes in the other groups.

Sleep quality and the number of sleep disturbances improved in all groups, including the control group. This could be due to simply being part of a health intervention, which included a month of lifestyle education classes, Brellenthin suggested.

It's unclear why the aerobic-exercise group didn't show greater gains, given the wealth of research showing it improves sleep, she said, but it had fewer poor sleepers at baseline than the resistance group (33% vs 42%). "So it may be that people who were already getting good sleep didn't have much room to improve."

Among the poor-quality sleepers at baseline, resistance exercise significantly improved sleep quality (-2.4 vs -1.0 points; $P = .009$) and duration ($+36$ vs $+3$ minutes; $P = .02$), compared with the control group. It also improved sleep efficiency by 9.0%, compared with 0.9% in the control group ($P = .002$) and 8.0% for the combined-exercise group ($P = .01$).

"For a lot of people who know their sleep could be a bit better, this could be a place to start without resorting to medications, if they wanted to focus on a lifestyle intervention," Brellenthin said.

It's not fully understood how resistance exercise improves sleep, but it might contribute to better overall mental health and it might enhance the synthesis and release of certain hormones, such as testosterone and human growth hormone, which are associated with better sleep, Brellenthin said. Another hypothesis is that it causes direct microscopic damage to muscle tissue, forcing that tissue to adapt and grow over time. "So potentially that microscopic damage could provide that extra signal boost to the brain to replenish and repair, and get this person sleep."

The study was limited by the use of self-reported sleep outcomes and a lack of detailed information on sleep medications, although 81% of participants reported taking no such medications.

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