

# Best Exercise For Sleep

## Resistance training may be the best workout for good sleep

*It is well known that exercise improves sleep. But is there a type of exercise that is best to promote sleep? Is time on the elliptical better than pumping iron for a night of better sleep? Will I fall asleep faster if I do HIIT or does taking a walk lead to better rest? This study looked at the effects of 12 months of regular exercise on overall sleep duration, sleep efficiency (time sleeping vs time in bed), and sleep latency (time to fall asleep). If you are interested in improving sleep without resorting to medication, this study has some interesting suggestions.*



### Abstract

- **Introduction:** Poor sleep quality is associated with high blood pressure and elevated cholesterol, and regular short sleep (<7 hours) has been found to increase the risk of cardiovascular events. The American Heart Association recommends aerobic physical activity to improve sleep, although there are limited data on the effects of other popular types of physical activity, such as resistance exercise, on sleep.
- **Hypothesis:** We hypothesized that 1 year of aerobic, resistance, and combined aerobic and resistance exercise would significantly improve sleep compared to a no-exercise control group.
- **Methods:** Participants were 406 inactive adults (53% women, 35-70 years) with overweight/obesity and elevated/stage 1 hypertension at high risk of cardiovascular disease. They were randomly assigned to 1 of 4 groups: aerobic exercise (AE) only (n=101), resistance exercise (RE) only (n=102), combined AE and RE (CE) (n=101), and no-exercise control group (CON) (n=102) for 1 year. All exercise participants performed time-matched supervised exercise 3 times/week, 60 min/session (CE performed 30 min of each AE and RE), at 50-80% of their maximum intensity. Participants completed the Pittsburgh Sleep Quality Index (PSQI) at baseline and 12 months, and only participants with complete baseline data on all PSQI subscales were included (n=386). Primary outcomes were the PSQI total sleep quality score (lower scores = better sleep), sleep duration (hours), sleep efficiency (time asleep/time in bed), sleep latency (time to fall asleep), and sleep disturbances (a combination of the number and frequency of disturbances). Linear mixed effects models following the intention-to-treat principle were used to determine the effects of exercise groups on 12-month changes in sleep outcomes while adjusting for age, sex, and the baseline values of each outcome.
- **Results:** Overall, 94% of participants completed the intervention with an 83% exercise adherence rate. The PSQI total score and sleep disturbances decreased significantly in all groups, including the control group. Within groups, sleep duration increased significantly by 17 minutes in RE (p=0.005), but not in AE (p=0.73; -2 min), CE (p=0.77; -2 min), or CON (p=0.13; -11 min), among participants getting less than 7 hours of sleep at baseline (p=0.02 for between-within groups interaction). Within groups, sleep efficiency increased in RE (p=0.0005) and CE (0.03), but not in AE (p=0.97) or CON (p=0.86; p=0.04 for between-within groups interaction). Sleep latency also decreased by 3 minutes in RE (p=0.003), although the overall between-within groups interaction effect was not significant (p=0.14).
- **Conclusions:** These results indicate that resistance exercise may have superior benefits on sleep compared to aerobic exercise, which could provide a novel pathway for the role of resistance exercise in promoting cardiovascular health.

*The researchers recruited 406 inactive adults, aged 35 to 70 years, who were obese or overweight (mean body mass index, 31.2 kg/m<sup>2</sup>) and had elevated or stage 1 hypertension and randomly assigned them to no exercise or 60 minutes of supervised moderate to vigorous aerobic exercise using treadmills, bikes, or ellipticals, full-body resistance training, or combination exercise (aerobic exercise and resistance training) three times per week for 12 months. Exercise adherence over the year was 84%, 77%, and 85%, respectively. Participants completed the Pittsburgh Sleep Quality Index (PSQI) at baseline and 12 months.*

*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 minutes in the aerobic-exercise group, and increased by 2 minutes in the combined-exercise group, and by 4 minutes in the control group. While this doesn't sound very spectacular, among participants who got less than 7 hours of sleep at baseline sleep duration increased by 40 minutes, 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 and combined 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.*

*What are possible mechanisms for these findings? Resistance exercise might enhance the synthesis and release of certain hormones, such as testosterone and human growth hormone, which are associated with better sleep. Direct microscopic damage to muscle tissue from resistance training forces the tissue to adapt and grow over time which could provide an extra signal boost to the brain to replenish and repair, thus triggering more sleep.*

*While the numbers may not seem spectacular, many of us are chronically getting less than 7 hours of sleep and this is the group that showed the most gain (40 minutes) in sleep duration and sleep latency. Any exercise is good for us but if you want to emphasize your sleep, consider adding resistance training to your exercise routine.*

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