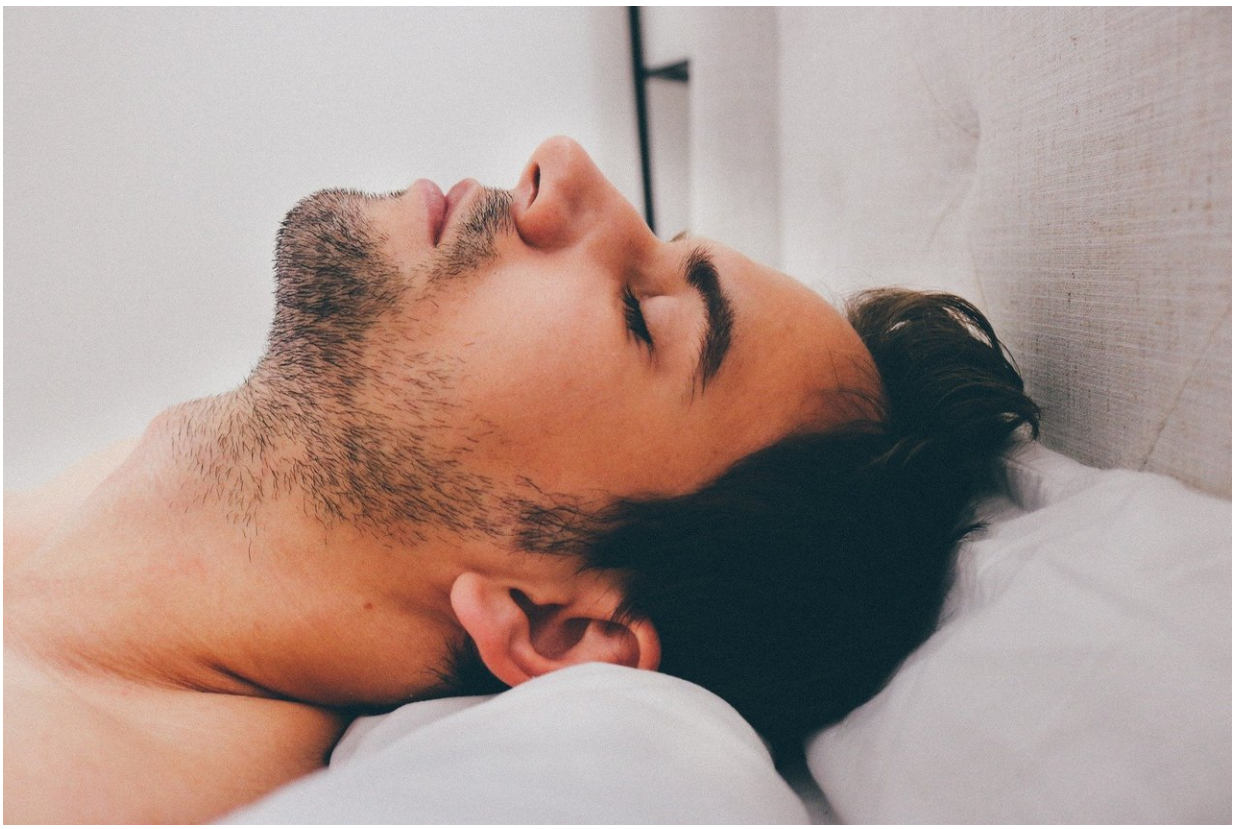
Study suggests reviewing current recommendations that discourage exercise before bed

July 16 2024



Credit: CC0 Public Domain

Findings of a small comparative study published in the open access journal *BMJ Open Sport & Exercise Medicine* suggest resistance exercise

'activity breaks' at night may improve sleep length. Three-minute breaks every 30 minutes over a period of four hours may be all that's needed, the findings indicate.

Current recommendations discourage intense exercise before going to bed, on the grounds that it increases body temperature and heart rate, which can result in poorer sleep quality, say the researchers.

While activity breaks can improve metabolism after a meal, it's not clear if they have any impact on sleep. Poor sleep is associated with an increased risk of cardiometabolic disorders, such as coronary heart disease and type 2 diabetes, explain the researchers.

To explore this further, the researchers recruited 30 non-smokers, aged 18 to 40, to their study. All of them reported clocking up more than five hours of sedentary time during the day at work and two hours in the evening.

To capture habitual physical activity and sleep patterns, participants wore an activity tracker worn continuously on their non-dominant wrist for seven consecutive days. And they were asked to record the periods they didn't wear it, the time they went to bed, and when they woke up.

They were also asked to record any physical activity when not wearing the activity tracker, such as swimming or contact sport, and to record activities known to be inaccurately identified by the tracker, such as stationary cycling or yoga.

Each participant completed two, four-hour sessions in a controlled laboratory environment on the same day of the week, starting at around 17:00–17:30 hours, and separated by a minimum period of six days.

In one session, participants remained seated for four hours; in the other,

they did three minutes of simple resistance exercise every 30 minutes over the four-hour period. Afterwards, participants returned to their normal, real-life environment.

Each activity break included three rounds of three exercises: chair squats, calf raises, and standing knee raises with straight leg hip extensions for 20 seconds each, in time with a video recording of a person doing the same exercises.

The activity tracker data showed that before the experiment, participants spent an average of seven hours 47 minutes asleep, 10 hours 31 minutes sitting down, and four hours 55 minutes engaged in vigorous physical activity a day.

Three out of four slept for the recommended seven hours a night, while the rest slept either less than that (21%) or longer than nine hours (4%).

The results, which are based on 28 participants, show that after the activity breaks, participants slept for an additional 27 minutes on average, compared with prolonged sitting.

The average sleep duration was seven hours 12 minutes, compared with six hours and 45 minutes after prolonged sitting. And while the time at which participants attempted to go to sleep was more or less the same, average wake times differed. Participants woke, on average, at 7:35 am after the prolonged sitting intervention and 8:06 am after regular activity breaks.

What's more, there were no significant differences in sleep efficiency—uninterrupted sleep—or the number of awakenings during the night between the two interventions, indicating that activity breaks didn't disrupt subsequent sleep, say the researchers.

There were no statistically significant differences in activity patterns in the 24 hours following each intervention. But compared with prolonged sitting, regular activity breaks resulted in 18 fewer minutes of total physical activity—less than 2% of total wake time.

The researchers acknowledge various limitations to their findings. For example, the study involved small numbers of participants and was conducted in a laboratory setting, which may not reflect real life behavior.

Further studies involving larger numbers of people in their normal home environment, and for a longer period, are therefore needed, emphasize the researchers.

But they nevertheless say, "These results add to a growing body of evidence that indicates evening exercise does not disrupt sleep quality, despite current sleep recommendations to the contrary."

And they point out that "adults accrue the longest periods of sedentary time and consume almost half their daily energy intake during the evening, added to which insulin sensitivity is lower at this time."

By extending sleep duration, especially in those who sleep less than the recommended nightly total, activity breaks may potentially reduce cardiometabolic disease risk over the long term, they suggest.

The resistance exercises used in their study are simple to do, don't require any equipment, and can even be done while streaming content, potentially increasing the chances of keeping up the routine, they add.

They highlight, "While existing research indicates that evening exercise may not adversely impact sleep, the mechanisms by which [it] influences sleep quality remain unclear."

More information: Evening regular activity breaks extend subsequent free-living sleep time in healthy adults: a randomised crossover trial, *BMJ Open Sport & Exercise Medicine* (2024). DOI: 10.1136/bmjsem-2023-001774