

# *Nine more minutes a day of vigorous exercise tied to better cognition*

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**Middle-aged adults who spend just 9 additional minutes a day participating in moderate to vigorous physical activity (MVPA) experience improved cognition in new findings that underscore the critical role brisk exercise, such as running and cycling, plays in brain health.**

**“Even minor differences in daily behavior appeared meaningful for cognition in this study,” researcher John J. Mitchell, MSci and PhD candidate, Medical Research Council, London, told this news organization.**

The findings were published online in the Journal of Epidemiology and Community Health.

## Research gap

Previous research has linked physical activity (PA) with increased cognitive reserve, which delays the onset of cognitive decline in later life. But disentangling the most important components of PA for cognition – such as intensity and volume – has not been well researched.

Previous studies didn’t capture sleep time, which typically takes up the largest component of the day. Sleep is “acutely relevant” when examining cognition, the investigators noted.

In addition, studies in this area often focus on just one or two activity components of the day, which “neglects the growing awareness” that movements “are all tightly interlinked,” said Mr. Mitchell.

The new study included 4,481 participants in the British Cohort Study who were born in 1970 across England, Scotland, and Wales. The participants were followed throughout childhood and adulthood.

The median age of the participants was 47 years, and they were predominantly White, female (52%), married (66%), and well educated. Most were occasional or nonrisky alcohol consumers, and half had never smoked.

The researchers collected biometric measurements and health, demographic, and lifestyle information. Participants wore a thigh-mounted accelerometer at least 7 consecutive hours a day for up to 7 days to track PA, sedentary behavior (SB), and sleep time.

The device used in the study could detect subtle movements as well as speed of accelerations, said Mr. Mitchell. “From this, we can distinguish MVPA from slow walking, standing, and sitting. It’s the current best practice for detecting the more subtle movements we make, such as brisk walking and stair climbing, beyond just ‘exercise,’ “ he added.

Light intensity PA (LIPA) describes movement such as walking and moving around the house or office, while MVPA includes activities such as brisk walking and running that accelerate the heart rate. SB, defined as time spent sitting or lying, is distinguished from standing by the thigh inclination.

On an average day, the cohort spent 51 minutes in MVPA; 5 hours, 42 minutes in LIPA; 9 hours, 16 minutes in SB; and 8 hours, 11 minutes sleeping.

Researchers calculated an overall global score for verbal memory and executive function.

The study used “compositional data analysis,” a statistical method that can examine the associations of cognition and PA in the context of all components of daily movement.

The analysis revealed a positive association between MVPA and cognition relative to all other behaviors, after adjustment for sociodemographic factors that included sex, age, education, and marital status. But the relationship lessened after further adjustment for health status – for example, cardiovascular disease or disability – and lifestyle factors, such as alcohol consumption and smoking status.

SB relative to all other movements remained positively associated with cognition after full adjustment. This, the authors speculated, may reflect engagement in cognitively stimulating activities such as reading.

To better understand the associations, the researchers used a statistical method to reallocate time in the cohort’s average day from one activity component to another.

“We held two of the components static but moved time between the other two and monitored the theoretical ramifications of that change for cognition,” said Mr. Mitchell.

## Real cognitive change

There was a 1.31% improvement in cognition ranking compared to the sample average after replacing 9 minutes of sedentary activity with MVPA (1.31; 95% confidence interval [CI], 0.09-2.50). There was a 1.27% improvement after replacing 7 minutes of LIPA with MVPA, and a 1.2% improvement after replacing 7 minutes of sleep with MVPA.

Individuals might move up from about the 50th percentile to the 51st or 52nd percentile after just 9 minutes of more moderate to vigorous movement in place of sitting, said Mr. Mitchell. “This highlights how even very modest differences in people’s daily movement – less than 10 minutes – is linked to quite real changes in our cognitive health.”

The impact of physical activity appeared greatest on working memory and mental processes, such as planning and organization.

On the other hand, cognition declined by 1%-2% after replacing MVPA with 8 minutes of SB, 6 minutes of LIPA, or 7 minutes of sleep.

The activity tracking device couldn't determine how well participants slept, which is "a clear limitation" of the study, said Mr. Mitchell. "We have to be cautious when trying to interpret our findings surrounding sleep."

Another limitation is that despite a large sample size, people of color were underrepresented, limiting the generalizability of the findings. As well, other healthy pursuits – for example, reading – might have contributed to improved cognition.

## Important findings

In a comment, Jennifer J. Heisz, PhD, associate professor and Canada research chair in brain health and aging, department of kinesiology, McMaster University, Hamilton, Ont., said the findings from the study are important.

"Through the statistical modelling, the authors demonstrate that swapping just 9 minutes of sedentary behavior with moderate to vigorous physical activity, such as a brisk walk or bike ride, was associated with an increase in cognition."

She added that this seemed to be especially true for people who sit while at work.

The findings "confer with the growing consensus" that some exercise is better than none when it comes to brain health, said Dr. Heisz.

"Clinicians should encourage their patients to add a brisk, 10-minute walk to their daily routine and break up prolonged sitting with short movement breaks."

She noted the study was cross-sectional, "so it is not possible to infer causation."

The study received funding from the Medical Research Council and the British Heart Foundation. Mr. Mitchell and Dr. Heisz have disclosed no relevant financial relationships.

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