







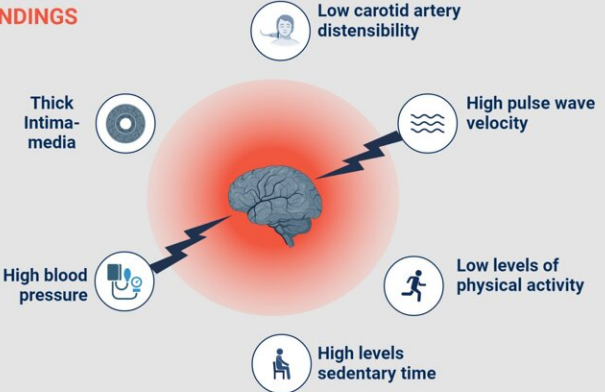

Study finds higher blood pressure is associated with poorer cognition in adolescence


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QUESTION Is arterial health associated with cognitive functions in adolescents? Are physical activity or sedentary time confounding factors in these associations?

CONCLUSION Higher blood pressure and arterial stiffness were related to poorer cognitive functions in adolescents. Physical activity or sedentary time did not confound the associations.

POPULATION	EXPOSURES	FINDINGS
 116 adolescents 45 girls 71 boys Mean age 15,9 years	 Blood pressure  Pulse wave velocity  Carotid intima-media thickness and carotid artery distensibility  Physical activity and sedentary time	
MAIN OUTCOME  Cognitive function		

Jalanko P, Bond B, Laukkanen J, Brage S, Ekelund Uif, Laitinen T, Määttä S, Kähkönen M, Haapala EA, Lakka TA. Association between arterial health and cognition in adolescents: The PANIC study. *Physiological Reports* 2024 

Is arterial health associated with cognitive functions in adolescents? Credit: Petri Jalanko

Adolescents with elevated blood pressure and arterial stiffness may experience poorer cognitive functions, according to a recent Finnish study conducted at the University of Jyväskylä and the University of

Eastern Finland. Young people with higher blood pressure performed worse, especially in tasks that measured attention and learning.

In addition, [arterial stiffness](#) was reflected in weaker working memory. In view of the findings, the importance of preventing high [blood pressure](#) and arterial stiffness in childhood and adolescence is emphasized.

It is well-established that poor arterial health can lead to [cognitive decline](#) in adults. However, there is limited knowledge about this connection in [adolescents](#). To address this gap, this study examined the associations of arterial stiffness and blood pressure with cognition in adolescents and whether these associations differed between girls and boys. Moreover, it examined whether [physical activity](#) or sedentary time are confounding factors in these associations.

Higher blood pressure was a more significant factor in the brain health of girls

Adolescents with higher blood pressure had poorer attention, learning, and overall cognition. Higher pulse wave velocity, an indicator of arterial stiffness, was associated with poorer working memory.

Interestingly, girls with higher blood pressure demonstrated a negative association with a broader range of cognitive functions than boys. Conversely, boys with higher arterial stiffness exhibited better attention and working memory. The associations were not influenced by either physical activity or sedentary time.

"Our findings underscore the importance of preventing high blood pressure and arterial stiffening to promote cognitive and brain health in [young people](#). However, we did observe some contradictory

associations," says Doctoral Researcher Petri Jalanko from the Faculty of Sport and Health Sciences at the University of Jyväskylä.

"The study provides insight into how blood pressure and arterial stiffness are linked to cognitive function. However, to establish a definitive cause-and-effect relationship between arterial health and [brain health](#), and to determine whether increasing physical activity or reducing sedentary time can mitigate the negative effects of poor arterial health on cognition, further randomized controlled trials with appropriate control groups and advanced brain imaging techniques are necessary."

The study utilized cross-sectional data from the eight-year follow-up assessments of the Physical Activity and Nutrition in Children (PANIC) study. A total of 116 adolescents (45 girls and 71 boys) participated, and their mean age was 15.9 years. Systolic and diastolic blood pressure were measured using an aneroid sphygmomanometer. Pulse wave velocity was measured by impedance cardiography, while carotid intima-media thickness and carotid artery distensibility were measured by carotid ultrasonography.

The CogState test battery was used to assess cognition, with overall cognition computed from the results of attention, working memory, and learning tests. Physical activity and [sedentary time](#) were assessed using a combined accelerometer/heart rate monitor. The study was [published](#) in *Physiological Reports*.

More information: Petri Jalanko et al, Association between arterial health and cognition in adolescents: The PANIC study, *Physiological Reports* (2024). [DOI: 10.14814/phy2.16024](https://doi.org/10.14814/phy2.16024)

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