

Research Roundup

Prehypertension and the risk of stroke

In the United States, one in three people have hypertension, or high blood pressure. Hypertension is classified as having blood pressure at or higher than 140/90 mm Hg. Normal blood pressure at or below 120/80 mm Hg.



What is hypertension?

Blood pressure is measured in the arteries, which carry blood away from the heart. It measures the force the blood is exerting on the arterial walls.

Hypertension can be caused by a narrowing of the arteries, possibly due to a thickening of the arterial walls, or an increased blood volume in the arteries. Other causes include the heart pumping faster than usual, or with increased force.

Why are there two numbers?

Blood pressure is read as “systolic over diastolic.” The systolic pressure is the blood pressure when the heart beats and is pumping blood through the arteries. The diastolic pressure is the pressure in the arteries when the heart is at rest between beats.

What are the risk factors?

Being at risk for hypertension is caused by a variety of factors. While some cannot be changed, such as age—older than 45 in men, 65 in women—race, family history and kidney disease, you have control over others. These include being overweight, not being physically active, tobacco use, high sodium intake, low potassium intake, alcohol intake, sleep apnea and stress.

What does it cause?

Hypertension is a serious matter as it can lead to increased risk of heart attack, stroke, aneurysm, heart failure, kidney failure, vision loss, metabolic syndrome and trouble with memory or understanding. Because hypertension contributes to these potentially fatal problems, it is essential to manage your blood pressure within acceptable values.

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Prehypertension occurs at a blood pressure above 120/80 mm Hg, but below 140/90 mm Hg. Recent studies found prehypertension also increases the risk for stroke and is a warning sign for hypertension. The risk increases as blood pressure increases which reiterates the importance of maintaining a normal blood pressure. With hypertension, the higher your blood pressure, the higher your risk of stroke. In order to decrease blood pressure and achieve normal blood pressure, lifestyle changes are recommended. For example, a diet with less sodium intake and increased exercise can act to decrease blood pressure. Talk to your doctor to determine your target weight as losing weight also helps decrease blood pressure. One diet to consider is the DASH diet (Dietary Approaches to Stop Hypertension). Research shows the diet lowers blood pressure by focusing on fruits and vegetables, lowfat dairy products, whole grains, fish, poultry, beans, seeds, nuts and vegetable oils while limiting sodium, sweets and red meats.

It is recommended to get your blood pressure checked once every one to two years if you are over 18, but most doctors recommend getting it checked at every visit. If you've already been diagnosed with high blood pressure, or are at risk for high blood pressure, it is important to keep a close eye on your blood pressure. Be aware of the risks of hypertension and start preventing it now.

Physical fitness' effects on children's academic performance

A study published in the *Journal of Pediatrics* showed a correlation between physical fitness and academic performance in youth. More specifically, the research team found cardiorespiratory capacity and motor ability positively correlate with academic performance.



They measured different aspects of physical fitness using a variety of tests. For example, muscular strength was measured using a maximum handgrip strength test and the standing long jump. Researchers assessed motor ability using a 4x10 m shuttle run. Cardiorespiratory capacity was calculated using the 20 m shuttle run. Finally, academic performance was measured using the children's individual grades, average grades and GPA. The letter grades were converted into numeric values for the study.

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After adjusting for different factors, researchers discovered cardiorespiratory capacity and motor ability were associated with positive academic performance. Muscular strength showed no relationship with performance in school. The participants were divided into four groups: those with no risk factors for poor academic performance, those with motor ability risk factor, those with cardiorespiratory risk factor and those with both risk factors. Children were considered part of a risk factor group if they fell below the FitnessGram standard 75th percentile.

The students who were considered a part of the no risk factor group had the highest academic scores out of the groups. There was a significant difference in academic scores between children with no risk factors and children with one risk factor, as well as between children with no risk factors and children with two risk factors.

The researchers discuss the benefits of implementing physical activity programs that include motor training. It is possible these programs would improve motor ability and also increase academic performance. One hypothesis for this is the extent of mental processing that occurs during motor tasks. Therefore, when children complete motor training tasks, they are exercising and improving their mental processing.

Additionally, muscle strength and motor ability are thought to be related to synaptogenesis. Synaptogenesis is the formation of synapses between neurons. Neurons communicate with each other via synapses, so the creation of new synapses increases neuron communication and possibly learning. Specifically, researchers propose these effects of physical activity improve children's cognitive control, cognitive flexibility and working memory.

Furthermore, cardiorespiratory capacity is said to have a positive relationship with angiogenesis. Angiogenesis is the formation of new blood vessels from old blood vessels. Researchers suggest that with increased cardiorespiratory capacity comes angiogenesis, which allows for more oxygen to be carried to the brain. This increase in oxygen could increase classroom performance by affecting learning, cognitive control and working memory.

Researchers acknowledge this study does not prove enrolling your child in physical activities will increase his/her academic performance. There may be confounding factors in the study. For example, it is possible those children who are more motivated to do well academically also are more motivated to do well on physical fitness tests. Regardless of whether physical fitness influences academic performance or not, it is still important children are active and involved. Don't forget physical activity has many other health benefits that will help keep your child healthy and ready to learn.

