

- Exercise

## Train the brain

### Explains how exercise can change your brain

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EXERCISE IS KNOWN for the positive physical benefits it provides us. Improved cardiovascular health, increased muscle strength and help with weight management are prime examples.



But ongoing research shows regular physical activity also leads to a variety of beneficial changes in the brain. In other words, exercise profoundly influences our brain function and mental health.

#### Improved cognitive function

Physical activity increases blood flow to the brain, ensuring it receives ample oxygen and nutrients necessary for optimal performance. Additionally, exercise enhances the connectivity between different brain regions, facilitating better communication and co-ordination. Improvements in cognitive function, including attention, processing speed, executive function, and working memory, have all been linked to regular exercise.

A recent study published in the journal *Neurology* found individuals who engaged in moderate to vigorous physical activity had a slower rate of cognitive decline compared with those less active. This suggests exercise is a key player when it comes to retaining cognitive abilities as we age, potentially reducing the risk of neurodegenerative diseases such as Alzheimer's and Parkinson's.

#### Growth of new brain cells

Exercise promotes neurogenesis, the process of forming new neurons.

One of the most significant effects on the brain is its ability to promote neurogenesis, the process of forming new neurons. This occurs particularly in the hippocampus, a region of the brain associated with memory and learning. Studies show proper exercise stimulates the production of brain-derived neurotrophic factor. This is a protein that supports the survival, growth and differentiation of new neurons and synapses enhancing brain plasticity and improving cognitive function.

#### Stress reduction, emotional wellbeing

When it comes to managing stress, enhancing emotional wellbeing and diminishing the symptoms of anxiety and depression, exercise is unparalleled. Physical activity triggers the release of endorphins, often referred to as “feel-good” hormones, which help alleviate pain and induce feelings of pleasure and euphoria. Moreover, exercise lowers the levels of stress hormones like cortisol and adrenaline, fostering a sense of calm and relaxation. The mechanisms behind this are multifaceted, involving both physiological and psychological factors. Physiologically, exercise increases the levels of neurotransmitters like serotonin and norepinephrine, which are known to regulate mood. Psychologically, engaging in physical activity provides a sense of accomplishment and boosts self-esteem, contributing to overall mental health.

#### Enhanced brain plasticity

Brain plasticity, or neuroplasticity, is the brain’s ability to reorganise itself by forming new neural connections throughout life. Increased plasticity helps improve learning, memory, and other cognitive functions. Exercise plays a crucial role in this process by enhancing brain plasticity, making the brain more adaptable and capable of recovering from injury, both crucial factors in the context of aging and neurological disorders.

Physical activity is what stimulates the release of growth factors, essential for the formation of new synaptic connections and the repair of damaged neurons.

#### Improved sleep quality

Exercise also has a positive impact on sleep quality, which in turn affects brain health. It helps to regulate the sleep-wake cycle, promoting deeper and more restful sleep. Why is this important? Because quality sleep is essential for cognitive functions such as memory consolidation, problemsolving and emotional regulation.

Research has shown that individuals who exercise regularly tend to fall asleep faster, enjoy deeper sleep and wake up feeling more refreshed. Improved sleep quality reduces the risk of sleep disorders such as insomnia and sleep apnea, which are associated with cognitive decline and mental health issues.

#### Increased brain volume

Another fascinating effect of exercise on the brain is its ability to increase brain volume, particularly in regions associated with cognitive function. Studies using magnetic resonance imaging (MRI) have shown that individuals who engage in regular physical activity have larger volumes of grey matter (containing neuron cell bodies) and white matter (composed of myelinated axons) compared to those who are less active.

The British Journal of Sports Medicine published a study revealing that older adults who participated in proper exercise had increased hippocampal volume, which is associated with better memory and learning abilities. This suggests exercise helps counteract age-related brain shrinkage, another aid when it comes to preserving cognitive function.

#### Social and psychological benefits

In addition to the direct physiological effects on the brain, exercise also provides numerous social and psychological benefits that contribute to overall brain health. Participating in group activities or sports enhances social interaction, reduces feelings of loneliness and

provides a sense of community and support. These social connections are crucial for mental wellbeing and can help buffer against stress and depression.

Additionally, setting and achieving fitness goals is a real self-confidence booster and provides a sense of purpose and accomplishment. This positive mindset and enhanced resilience enable individuals to better handle life's challenges.

From promoting neurogenesis and brain plasticity to reducing stress and improving sleep quality, the benefits of regular physical activity are far-reaching. It is a powerful tool capable of inducing profound changes in the brain, enhancing cognitive function, emotional wellbeing and overall brain health.

By incorporating a combination of strength training, aerobic activities and regular daily movement, we establish a strong foundation for a healthier lifestyle. This commitment enhances our brain's health and function, ultimately leading to a higher quality of life.

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