

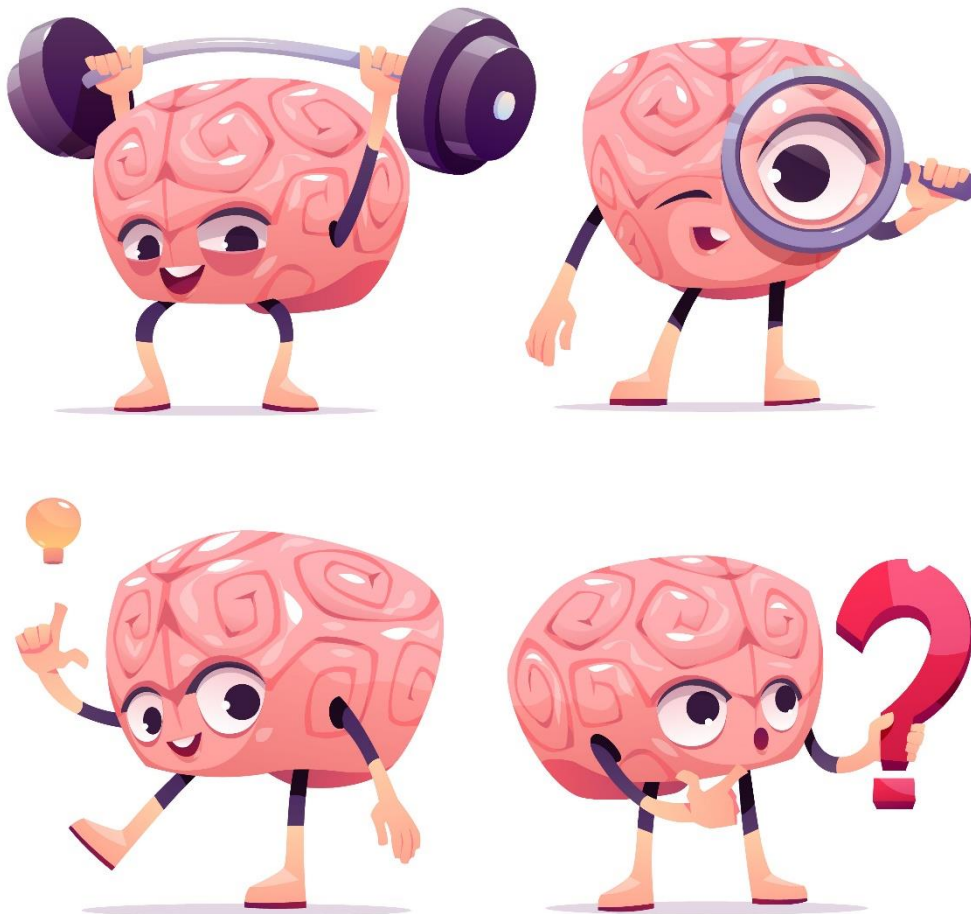
The connection between brain health and nutrition

Introduction

In this article, I would like to write about the role of nutrition in brain development, disease prevention, and healing.

Foremost, I will write about the interrelation between brain development and nutrition during the most vulnerable time of brain development – in utero and during the first years of life.

Secondly, I will explain the connections between nutritional deficiencies and today's most common neurological disorders in childhood, adulthood, and elderhood. Even though some of these disorders are not necessarily connected only to one life stage, for simplicity's sake they will only be observed in individual paragraphs.



Brain development and nutrition

First of all, I would like to write about the importance of nutrition in brain development, which occurs most intensely in utero and during the first 3 years of life, until about the age of 28. Brain tissue is most sensitive to nutritional insufficiencies during this time of its rapid development. For this reason, I researched which nutrients play the most significant role in brain development.

Studies suggest (1) that lack of some nutrients can cause global neurological deficits and lack of other nutrients can cause area-specific deficits. For example, the absence of **choline** in nutrition or protein-energy insufficiencies are shown to cause global neurological deficits. This can lead to a reduction in brain size through various biological mechanisms. On the other hand, lack of **iron** in rodents is associated with deficits in trace recognition memory, procedural memory, and spatial navigation, which suggests abnormalities in the hippocampus and striatum. **Zinc** deficiency could lead to autonomic nervous system instability. Additionally, lack of zinc in monkeys causes poor short-term memory. Some other important nutrients for brain development are shown to be **long-chain polyunsaturated fatty acids, copper, iodine, selenium, magnesium, folate, B vitamins, vitamin A and vitamin D**.

Nutrition and neurological disorders in childhood

In addition, I will go through some of the most common neurological diseases in childhood and their connection with nutritional deficiencies. These are ADHD, ASD, and epilepsy.

Attention-Deficit / Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder, characterized by hyperactivity and impulsiveness, and difficulty concentrating. It is more often diagnosed in boys than girls, because symptoms in girls may be less obvious. Some studies have found a connection between **Vitamin D** and **Magnesium** co-supplementation and improvement in behavioral issues and mental health in children suffering from ADHD (2). Others suggest a correlation between **iron** supplementation and ADHD symptoms improvement (3). **Zinc** deficiencies are also found in children suffering from ADHD.

Autism spectrum disorder (ASD) is a developmental disability involving challenges in social skills, speech, and repetitive behavior.

Some studies have shown that maternal **vitamin D** deficiency during pregnancy correlates with an increased risk of ASD (4).

Epilepsy is a neurological disorder with seizures as the most common symptoms.

Lack of **vitamin B6** is known to cause or worsen seizures. Some studies have shown that **omega-3 PUFA, Vitamin C, Vitamin D3, and Vitamin E** have the potential to manage the number of seizures (5).

Nutrition and neurological disorders in adulthood

Furthermore, I will write about multiple sclerosis, migraine, anxiety, and depression and their relation to nutrition.

Multiple sclerosis is a disease characterized by the demyelination of neurons. It can involve the brain and spinal cord leading to disability. One extensive study suggests (6) that **Vitamin D** deficiency in women strongly correlates with the risk for developing Multiple Sclerosis.

One of today's most common diseases, anxiety, and depression are also shown to correlate with nutritional status. One study shows that lack of **Vitamin B6** and **iron** in blood correlates with the risk of a panic attack (7).

Moreover, migraines are moderate to severe headaches that can last up to a few days. One study suggests that many nutrients could have preventive or curative effects on migraine patients: **magnesium, carnitine, riboflavin, niacin, CoQ10, vitamin D, Vitamin B12, and alpha-lipoic acid** (8).

Nutrition and neurological disorders in older age

Last but not least, I would like to explain the interconnection between nutrition and today's most common neurological disorders in older age, Alzheimer's and Parkinson's disease.

Parkinson's disease is a condition caused by a reduction in dopamine levels in the brain. This leads to tremor, slow movement, and stiff muscles. Some studies suggest that nutrition could play a role in reducing symptoms of Parkinson's disease and possibly slow down disease advancement. It is suggested that people with Parkinson's disease are deficient in **Vitamin C and D, glutathione, and CoQ10** (9) and that supplementation with **B-Vitamins, D Vitamin, CoQ10, and omega-3 fatty acids** could help in Parkinson's disease management(10).

The last disease that I will mention in this post, Alzheimer's disease, is the most prevalent cause of dementia. It is characterized by memory loss and difficulties with thinking. Studies suggest that people with **Vitamin D** deficiency are more likely to develop Alzheimer's disease (11). Others show that **B Vitamins, homocysteine, and dietary fats** play a role in the pathogenesis of Alzheimer's disease (12).

Conclusion

To sum up, one can see that there are around fifteen main nutrients that are researched to play the most important role in brain health, the most common ones being Vitamins D and B, healthy fats, and minerals such as magnesium, iron, and zinc. Although further research is needed to draw stronger conclusions, implementing healthy eating habits with food rich in these nutrients could probably help us to grow and retain a healthy brain. You can read about food rich in these nutrients in my other [article](#).

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