

Cognitive Nutrition

Anitha Achuthan¹, Rohit K²

¹ Professor and HOD, Department of Physiology, Chengalpattu Medical College, Chengalpattu,

² III MBBS student, Saveetha Medical College, Chennai, Tamil Nadu, India

Abstract

For all the mysteries about the human brain, one clear conception: The brain needs nutritious foods, like the rest of the body. Studies report a positive link between breastfeeding and the mental abilities of children. Scientists found that breastfed infants do have higher verbal and nonverbal skills than children who consume only formula. Many people would like to improve their memory. Can foods help us remember things better? Several studies identify foods that may boost memory in healthy adults. Fruits and vegetables are crucial for maintaining a healthy mind and decelerating brain aging. The importance of vitamins to brain health is indisputable. Nuts, seeds and olive oil, healthy components of many traditional diets, are too good for the brain. Is age-associated cognitive decay inevitable? Can diet prevent mental deterioration as we age? Nutritional research has proven that various healthy diets may prevent mental decline and dementia. Dietary adjustments help in mental disorders. Clinical trials with the elderly identified nutrients that may have therapeutic benefits such as deferring dementia and memory loss. Moreover, several diets, especially the Mediterranean diet, are substantiated to be beneficial to people with neurodegenerative disorders. We Eat, Therefore We Think.

Corresponding Author

Dr. Anitha Achuthan, Professor and HOD, Department of Physiology, Chengalpattu Medical College, Chengalpattu, Tamil Nadu, India.

Telephone: +91- 9443154246, Email: anithabhavika@gmail.com

Introduction

Research suggests that healthy diet supports and even stimulate mental abilities and slows the advance of neurodegenerative disorders. Indeed, studies emphasize that many foods enhance intellectual capacities such as memory, motor skills, attention and learning. Such foods influence brain functions by stimulating signal transmission, by improving blood flow or by decreasing inflammation in the brain.

Diet and Mental Performance

Multiple studies have shown that caffeine improves cognitive performance. Caffeine maintains brain functions required for long-term activity, keeping people alert and focused. These effects are evident at a moderate caffeine dosage of 40 milligrams. According to recent research, caffeine supports

performance abilities and also reduces tiredness in game players (Dietz & Dekker 2017).

Considering natural drinks, green tea appears to be one of the healthiest beverages for enhancing mental processes. It stimulates cognitive abilities such as memory, focus and concentration, and helps to reduce stress (Dietz & Dekker 2017). Furthermore, the key active nutrients in tea—epigallocatechin-3-gallate (EGCG) and L-thiamine—helps the brain by inhibiting the free radicals (Feng et al. 2012).

Oleic acid and polyphenols, the nutrients in nuts and olive oil, maintains brain functions by affecting distinctive mechanisms in the central nervous system. Oleic acid diminishes inflammation, while oleocanthal, a phenolic component in olive oil, helps to prevent Alzheimer's disease. Polyphenols promote nerve growth and strengthen the blood flow of the

brain. Moreover, nuts and seeds also contain vitamins E and B6 and fiber. Independent of age, people who consume walnuts demonstrate better memory and quicker reaction times than those who avoid them. (Arab & Ang 2015). Brazil nuts are proved to enhance verbal fluency, drawing ability and executive function in older age (Rita C et al. 2016).

Fish, another paramount component of many healthy diets. Salmon, mackerel and herring, in particular, contain omega-3 fatty acids which activate nerve growth and suppress nervous system inflammation. Fish oil, therefore, is considered a natural brain-boosting supplement (Dyall 2015).

Several studies have reported that high consumption of fruits and vegetables reduce the risks of atherosclerosis and stroke, consequently preventing mental deterioration (Larsson, Virtamo and Wolk 2013). Eating the carotenoid lutein present in verdant vegetables improves cognitive functions especially verbal skills in the elderly (Johnson 2012).

Of the natural foods derived from root vegetables, beetroot juice is an exceptional source of nutritional nitrate, which is said to normalize blood pressure and stimulates blood supply in brain. Consuming beet juice modulates cerebral blood flow and boost intellectual performance (Wightman et al. 2015). A study published in the British Journal of Health Psychology associated consumption of fruits and vegetables with increased curiosity and creativity (Conner et al. 2015).

Nutrients for the Brain - From Pregnancy to Childhood

Ample researches claims that breast milk is superior to formula in its effects on cognitive development in infants (Deoni et al. 2018). Kafouri et al. study reports an association between extended breastfeeding and thickness of the cerebral cortex. Moreover, breastfed children have been observed to have larger head circumference than formula-fed children (Herba et al. 2013). Breastfeeding has also promoted to higher white-matter volume in teenagers (Isaacs et al. 2010).

Can vitamin supplements affect mental development in the womb and throughout childhood? Many trials say yes. Pregnant mothers' intake of micronutrients stimulates the development of motor skills, concentration and other intellectual capacities in children through preschool (Prado et al. 2012). Further, a study published in the American Journal of Clinical Nutrition suggests that micronutrients

enhance intellectual skills during childhood. Studies in which children were given multivitamin supplements have shown promising results, suggesting that micronutrients stimulate fluid intelligence (Eilander et al. 2010).

Nutrients helps to Keep Minds Sharp in Old Age

Research reviewed in the British Journal of Nutrition has suggested that fruit flavonoids in berries enhance memory via activation of brain blood flow (Spencer 2010). Regular intake of omega-3 fatty acids, folic acid, vitamins and beta-carotene are recommended for maintaining memory capacities.

Aging affects all of our organs, and definitely brain is no exception. Consumption of green leafy vegetables, beans, berries, nuts and olive oil prevents development of Alzheimer's disease. Resveratrol, a nutrient in berries and grapes, enhances memory skills in older individuals with excess weight (Witte et al. 2014). Scientists at Brigham and Women's Hospital and Harvard Medical School in Boston reported that eating blueberries and strawberries helps to prevent age-related mental decay; further, the study determined that anthocyanins (polyphenol compounds in berries) may prevent mental decline by up to 2.5 years (Devore et al. 2012). High intake of curcumin, a natural compound in the dietary spice turmeric and also a prominent component of the Middle Eastern and Indian cuisines, has been associated with low prevalence of Alzheimer's disease and enhancement of brain functions (Chen et al. 2018).

Macro Effects of Micronutrients

Foods rich in vitamin B improve different types of memory in middle-aged people. Supplementation with vitamins B, D and E helps patients with Alzheimer's disease. Intake of B vitamins—such as folate, B6 and B12—diminishes degeneration of several brain regions typically affected in older patients with memory disorders (Douaud et al. 2013). Vitamin B12 deficiency has been strongly associated with faster cognitive decline in older adults (Skarupski et al. 2010).

Vitamin D also been shown to prevent cognitive deterioration. Researchers at Tufts University in Boston found an association between vitamin D deficiency and dementia (Buell et al. 2010). Research also shows that consuming vitamins E and C enhances cognitive performance and decreases depression in the elderly. Since vitamin E a known

potent antioxidant and anti-aging nutrient, it may be involved in the maintenance of brain functions. One clinical study found that vitamin E prevents mental degradation (Dysken et al. 2014).

When assessing minerals, magnesium is crucial to normal activity of the brain. A lack of magnesium leads to an elevated level of free radicals and decline of antioxidants in the nervous system, as well as leads to neuronal damage and local inflammation (Barbagallo and Dominguez 2010). Several studies have established that magnesium helps treat neurodegenerative diseases (Ozturk and Cillier 2006) and improves memory in mouse models for Alzheimer's disease (Huang et al. 2018).

Administering iron supplements to adults with iron-deficient anemia significantly improves cognitive performance; suggesting iron has a high value for brain function (Khedr et al. 2008).

Diets Counter Cognitive Decay

It has been suggested that the Mediterranean diet are protective against neurodegenerative disorders such as Alzheimer's disease and Parkinson's disease. Following the Mediterranean diet—which is defined by high consumption of fruits, vegetables, olive oil, fish and nuts—was found to decrease participants' risk of stroke, a dominant cause of cognitive decline, by 46%. The elderly participants who consumed this diet demonstrated enhancement of memory and many other mental functions (Pribis & Shukitt-Hale 2014).

Interestingly, eating walnuts is specifically associated with memory enhancement. Recent research also reports a link between improved mental functions and consumption of polyphenols (Kesse-Guyot et al. 2012). For instance, flavanols, a subgroup of polyphenols in cocoa, expands brain blood volume and further promotes mental functions (Brickman et al. 2014).

Seafood, one of the core components of the Mediterranean diet, has been shown to reduce pathological changes in the brain of the patients with Alzheimer's disease (Morris et al. 2016). Combining the Mediterranean diet along with dietary approaches to stop hypertension also suppresses the progression of Alzheimer's disease (Morris et al. 2015). In addition, a calorie-restricted diet decreases the risk of developing Alzheimer's disease (Ramesh et al. 2010). Furthermore, weight loss in middle-age and in older adults with obesity definitely improves their cognitive abilities and motor skills (Siervo et al. 2012).

Following a Mediterranean or Norwegian diet—eating more fruits, vegetables, nuts and omega-3-rich foods is highly recommended for patients with depression (Opie et al. 2017). Depression which is often associated with inflammation in the nervous system, with fruits and vegetables, which contain many antioxidants, can be the beneficial anti-inflammatory nutrients. The omega-3s in fish and vegetables also decreases inflammation and protects neurons.

The Future - Cognitive Nutrition

Diet undoubtedly influence brain function and cognitive abilities at any age. Natural foods and supplements are proven to have healthy effects on fluid intelligence, memory and other mental skills. While the exact nature of these effects is uncertain, researches have discovered mechanisms such as increase in white matter, inhibition of inflammation, antioxidant actions and improvement of blood flow in the brain.

We still have much more to learn about the links between healthy balanced diets and the incidence of cognitive disorders. Moreover, science has not fully determined the medical significance of the nutrients in all the diets. It will be up to future research to answer these intuitive questions.

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