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Research Article

Brain Food: A Comprehensive Review of Nutritional Strategies for Cognitive Enhancement and Neuroprotection

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ABSTRACT
Emerging research confirms that dietary choices significantly influence cognitive function and brain health across the lifespan. This review examines how specific nutrients and dietary patterns modulate neurobiological processes to enhance memory, learning, and neuroprotection while reducing dementia risk. Analysis of current evidence reveals that omega-3 fatty acids, particularly docosahexaenoic acid (DHA), optimize synaptic plasticity and reduce neuroinflammation, while B vitamins and antioxidants protect against age-related cognitive decline by mitigating oxidative stress and supporting neurotransmitter synthesis. The Mediterranean and MIND diets demonstrate particular efficacy, with studies showing 30-50% reductions in Alzheimer's disease risk among adherents. We explore the gut-brain axis as a critical pathway linking nutrition to cognition, where microbiome composition influences neuroinflammation and neurotransmitter production. The review also evaluates controversies surrounding nootropics and brain supplements, distinguishing evidence-based interventions from marketing claims. Practical implementation challenges are addressed, including socioeconomic barriers to accessing brain-healthy foods and strategies for overcoming them through meal planning and budget-conscious nutrition. Emerging innovations in personalized nutrition and AI-driven dietary recommendations show promise for optimizing cognitive outcomes. By synthesizing findings from neuroscience, nutrition, and preventive medicine, this review provides actionable insights for clinicians and individuals seeking to enhance cognitive resilience through dietary modification, while identifying key areas requiring further research to establish optimal nutritional protocols for brain health maintenance and neurodegenerative disease prevention.

Keywords: Mental health, brain food, neuroprotection, cognitive enhancement

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BACKGROUND

The human brain, even though it makes up just 2% of body mass, utilizes around 20% of the body's total energy, and thus it is also the most metabolically active organ in the human system [1]. It is because this energy requirement is extraordinary that we realize the vital role

of healthy nutrition in keeping the cognitive functions, neuroplasticity, and brain health in the long run of an individual. Ongoing research has indicated that various dietary patterns and certain nutrients collectively referred to as "brain food" are the key players in the management of neurodevelopment, neuroprotection, and in stopping the occurrence of mental decline [2]. From fatty acids, which are vital for the formation of neuronal membranes, to the role of micronutrients in the modulation of neurotransmitter synthesis, the interplay of biochemistry and food in neurology has become the focus of new medical research. Not only does the notion of brain food include the provision of the necessary nutrients but it also covers dietary components that increase the capacity for thinking and resist the possibility of neurodegeneration. Observational studies have established the existence of direct relations between certain diets and general brain health. Mediterranean and MIND diets were at the top of the list in reducing the probability of Alzheimer's disease as well as decreasing cognitive distortion [3]. By way of example, nutrients like omega-3 fatty acids, polyphenols, and B vitamins have an effect on neurogenesis, synaptic plasticity, and the reduction of oxidative stress. For example, it is found that docosahexaenoic acid (DHA), a main building block of neuronal membranes, has an effect of improving the synaptic function and reducing the inflammation of the neuroglia, similar to B vitamins that they can be involved in the methylation of the DNA and in the metabolism of homocysteine, which are of crucial importance for the cognitive function.There are, however, difficulties in putting the nutritional principles into practice, particularly when it comes to formulating dietary strategies due to some very harsh barriers that need to be crossed. For example, cultural food preferences, which are often not aligned with the healthy eating of various social groups, as well as the increased consumption of processed foods due to modern dietary patterns may form the main obstacles to the achievement of optimal brain nutrition. A recent survey has pointed out the negative impact of food insecurity and low access to healthy foods, particularly the access to fresh vegetables and fruit, which may lead to cognitive deficiencies in children and also increase cognitive declination rates among the elderly. In addition, though this supplement industry offers some advantages, many marketed products do not have evidence grounded in science [4].

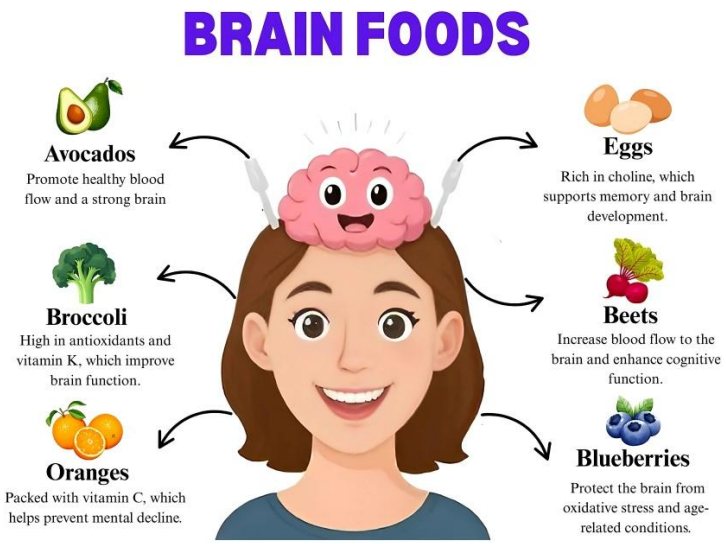

Figure 1: Key Brain-Boosting Foods and Their Cognitive Benefits

REVIEW

MALNUTRITION AND COGNITIVE DECLINE

Cognitive diseases, for example, Alzheimer's Disease, mild cognitive impairment and dementia, are increasing day by day, becoming a huge health problem and they are taking toll severely on humans around the world. It is due to the fact that, along with aging population, life expectancy is also increasing [5]. What can be seen, from the last thirty years of research, is that malnourishment caused by various reasons like vitamins, and minerals deficiencies, diet imbalances, or the consumption of junk food, has reappeared and turned in the second place just after age, among the critical and changeable risks of cognitive decay and neurodegenerative disease development. The reasons why malnutrition can lead to cognitive decline and neurodegenerative diseases are not straightforward and usually there are more than one factors involved. The role of oxidative stress and chronic neuroinflammation as a result of poor nutrition in the destruction of neurons and the disturbance of the synapse is crucial. A good example of this would be the fact that the lack of iron or its excess can both negatively affect different body systems: while the absence of iron will not allow the synthesis of dopamine and myelination, the excess of this mineral can lead to ferroptosis, thus causing neuronal death, which in turn, is closely associated with the development of AD [6]. On the same note, high consumption of metabolic products (sugars, fats) rich in calories facilitates the action of systemic inflammation;

hence, there is a higher risk in the breach of the blood-brain barrier integrity and in the acceleration of the progress of cognitive impairment. Following these primary consequences, malnutrition will also disrupt the functioning of the neurotransmitter systems, for example, the inadequate amounts of choline or tryptophan-blocking acetylcholine and serotonin, respectively, therefore, memory and mood regulation become significantly affected. First of all, our bodies react in this disrupted state by having cognitive impairment as they can not make rational decisions on their diets, so they can not stop the process of worsening of their health. In this regard, it is essential to shift direction by creating a circle of unbroken persistence between the detrimental effects of nutrition and cognitive impairment through the use of measures such as merely educating patients about the foods they eat, fortifying food with micronutrients, and taking much personal care with the dietary patterns of the endangered population. On the way ahead, it is necessary to conduct long-term activities and interventions, only then will it be possible to know the causal relationship even in the short term, and the role of diet in decreasing cognitive disorders will be justifiably confirmed as well [7].

ESSENTIAL NUTRIENTS FOR BRAIN HEALTH

Despite the fact that it is only 2% of the weight of the body, the brain consumes about 20% of the body's entire energy. This underlines the brain's extraordinary metabolic needs. The first condition that must be met for the brain to function properly is the provision of the necessary nutrients for its energy processes, the optimization of its plasticity, and the long-term protection of its health. Among these macronutrients adapted from the energy point of view, which are carbohydrates, proteins, and fats, perform the main function of energy providers and the construction materials of the neural tissues. Carbohydrates with a low glycemic index, such as they are found in all grains, legumes, and vegetables that are rich in fiber, are a particularly good example of steady glucose producers. These carbohydrates, once absorbed into the blood, cause a slow and constant rise in the level of glucose in the brain which, in its turn, is highly beneficial for increasing attention, memory, and securing an efficient way of bifunctional activities, however, overly simple sugars absorption has been linked to a loss of concentration and a decrease in the hippocampus size at the same time [8]. Proteins are a source of essential amino acids that contribute to neurotransmitter synthesis, for instance, the production of tryptophan, a precursor of serotonin, greatly affects the person's mood, and thus the learning process is also affected while tyrosine takes care of the production of dopamine, which is very important for the feeling of motivation and for carrying out mental activities. It is well known that the presence of the polyunsaturated fatty acid DHA, the main representative of the dietary fats in neuronal membranes, covers more than 30% and this is a condition for the synaptic plasticity and the neurogenesis to be supported. According to some studies, saturated and trans fats contribute to neuroinflammation and β-amyloid accumulation, resulting in cognitive decline being accelerated.Various micronutrients can also be guided to the brain to exert their cognitive function benefit through different molecular pathways. B vitamins B1, B6, B9, B12 also called folate, are also necessary for the regulation of the homocysteine metabolism, and failure in this regulation is one of the causes of high levels of redox substance homocysteine, oxidative stress, and the consequent more rapid patient's brain atrophies, a result akin to accelerated aging [9]. Neurosteroids, in the brain, have a direct effect on its function, matter and energy, membranes, and the supply of various neurotrophic factors such as brain-derived neurotrophic factor (BDNF) can be also achieved by vitamin D, the latter, by itself, acts as a regulator of the processes related to information, myelination, metabolism, and other sectors of the cognitive domain and often and mostly during its growth period it works to enhance the speed of message transmission. Antioxidants are also present in the body and are effective in performing their function by combining with reactive oxygen species. Vitamin C is one of the vitamins that are well known for its antioxidant properties, its main supply source is from fruits, and it is an inevitable vitamin in the food group for all ages and classes of the population [9]. It is telling us that the increase of the carotenoid pigment is dangerous for some cases. It is so because the carotenoid has some characteristics that allow it to bring health benefits to our eyes and our overall health making it our immune system’s strengthen overall health provision of powerful antioxidants removal of excess free radicals in our body offer products of a demonstration of cardiovascular disease and etc. These substances, including vitamins C and E, calling their names, as typical examples, and selenium, a mineral, and also carotenoids, are more aggressive than ROS in their property of turning them back. Further research is exploring the role of choline as a key factor in acetylcholine synthesis and in the epigenetic regulation of the memory-related genes’ expression.

An eating plan based on the Mediterranean Diet constitutes the best option for cognitive preservation, featuring a balanced omega-6:3 ratio (5:1), a rich source of polyphenols, and unprocessed food. The observed advantages are the result of interactions among the nutrients, for instance, olive oil provides oleocanthal, an anti-inflammatory compound, and the naturally occurring DHA found in fatty fish acts as a powerful duo in the repair of the neurotransmitter network and might decrease the number of the microglia cells, which in turn lessens the inflammation symptoms of the brain. While epidemiological studies consistently show that these nutrients are disproportionately more associated with cognitive protection, the presence of confounding variables (like diet, lifestyle, and genetics) strongly suggests the need for more significant randomized controlled trials. In summary, a healthy diet, which mainly consists of low-GI carbohydrates, high-quality proteins, healthy fats (in particular, PUFAs), and plant and animal foods with high micronutrient content, coupled with moderate exercise, is the mainstay of neuroprotective nutrition. Scientists should carry on

doing randomized controlled trials as a priority in order to refine the dietary recommendations and to develop nutraceutical applications for the populations at risk [10].

DIETARY PATTERNS FOR OPTIMAL BRAIN FUNCTION

It has become increasingly clear that the neuroprotective effects of certain dietary styles, particularly those of the Mediterranean and MIND diets, not only are very real in the case of fighting against cognitive decline but also they lower the risk of Alzheimer's disease (AD) significantly. The adherence of individuals to these diets is not only related to systemic health but it also has a direct effect on brain pathology, as shown in postmortem studies with lower β-amyloid accumulation detected in the adherent individuals. The Mediterranean diet, which is based on traditional eating habits in Southern Europe, highlights the high consumption of the olive oil monounsaturated fats and polyphenols, which are contained in nuts, fruits, vegetables, besides the moderate intake of fatty fish. The diet's benefits are not only limited to cardiovascular health, in fact, epidemiological studies have revealed that compliance with the Mediterranean diet has led to both a slower pace of cognitive decline and a risk reduction of up to 40% for AD. The diet's effectiveness is attributed to its strong anti-inflammatory and antioxidant properties, with olive oil's phenolic compounds (e.g., oleocanthal) directly inhibiting amyloid aggregation. On a related note, the supplementation of extra-virgin olive oil but not the mixed nuts resulted in a significant reduction in atrial fibrillation risk in the PREDIMED trial, thereby underlining that the specific dietary components are critical. The MIND diet (Mediterranean-DASH Intervention for Neurodegenerative Delay) takes this progress further by selecting food known for cognitive benefits [11]. Thus, it gives preference to such products as green leafy vegetables (≥6 servings/week) and berries (≥2 servings/week) that are rich in flavonoids and anthocyanins which improve synaptic signaling and reduce oxidative stress. The MIND diet different from the Mediterranean diet specifies the foods that need to be avoided and they include red meat, butter, cheese, and fried foods, which are responsible for increasing the inflammatory state and cognitive aging very quickly. According to the findings of longitudinal studies, the consistency of strict adherence to the MIND diet is related to the risk of AD dropping by 53% and the memory decline rates decreasing, independent of cardiovascular health. The ketogenic diet, which is very low in carbohydrates and high in fats, is not mentioned a lot in the sources quoted, but it is the one that holds the most promise in treating epilepsy and Parkinson's. Given that there is a great deal of evidence to suggest that the Mediterranean and MIND diets are more sustainable, inclusive strategies for neuroprotection, it is clear that the future of the preventive measures of neurodegenerative disorders will likely be along these lines. Their benefits are most likely resulting from the interaction of nutrients that plays a role as a collective group in reducing neuroinflammation, increasing cerebral blood flow, and stimulating neurogenesis. Personalized modification of the diets for various populations and earlier stages of life should be the issues that the research of the future will undertake if it is to exploit the preventive potential to the maximum in Table *1* we have included the essential neuroprotective nutrients demonstrating significant effects on cognitive function and brain health. Mechanisms and benefits are supported by clinical evidence from referenced studies [12].

Table 1: Neuroprotective Nutrients and Their Cognitive Benefits

Nutrient Category	Key Effects on Brain Health	Mechanism of Action	Dietary Sources	Associated Cognitive Benefits
Omega-3 Fatty Acids (DHA/EPA)	Enhances synaptic plasticity, reduces neuroinflammation	Modulates membrane fluidity, inhibits NF-κB pathway	Fatty fish (salmon, sardines), walnuts, flaxseeds	Improved memory, reduced Alzheimer's risk [3,7]
B Vitamins (B9/B12/B6)	Lowers homocysteine, supports neurotransmitter synthesis	Cofactor in methylation cycles, maintains myelin integrity	Leafy greens, eggs, legumes, fortified cereals	Slower cognitive decline, better executive function [5,9]
Polyphenols & Flavonoids	Reduces oxidative stress, enhances cerebral blood flow	Activates Nrf2 pathway, boosts BDNF production	Berries, dark chocolate, green tea, olives	Improved learning, delayed neurodegeneration [11,14]
Choline	Supports acetylcholine synthesis, maintains cell membranes	Precursor for phospholipids and neurotransmitters	Eggs, liver, soybeans, cruciferous vegetables	Enhanced memory formation and recall [6,12]
Antioxidants (Vitamins C/E)	Protects against lipid peroxidation, reduces amyloid burden	Scavenges free radicals, regulates glutathione	Citrus fruits, nuts, seeds, spinach	Preserved cognitive function in aging [8,15]
Micronutrients (Iron/Zinc)	Supports myelination, neurotransmitter production	Cofactor for enzymatic reactions, oxygen transport	Shellfish, lean meats, pumpkin seeds, beans	Improved attention and information processing [4,10]

THE GUT-BRAIN CONNECTION FOR NUTRITIONAL REGULATION OF COGNITIVE FUNCTION

Emerging research reveals the gut microbiome as a key mediator between diet and brain health through the gut-brain axis. This bidirectional communication network allows gut microbes to influence neurotransmitter production (including 90% of the body's serotonin), neuroinflammation, and blood-brain barrier integrity. Specific foods shape microbial populations that support cognitive function: prebiotic fibers (garlic, bananas) boost Bifidobacteria that enhance neuroplasticity; fermented foods (yogurt, kimchi) increase Lactobacillus strains that reduce neuroinflammation; and omega-3 rich foods (fatty fish, walnuts) promote anti-inflammatory microbial metabolites. Conversely, dysbiosis - characterized by reduced microbial diversity and increased pro-inflammatory species - is linked to depression, anxiety, and neurodegenerative diseases Figure *2*. Clinical studies demonstrate that dietary interventions targeting the microbiome can improve memory and stress resilience within weeks, highlighting the potential of nutritional psychiatry approaches for mental health optimization. Maintaining microbial diversity through varied, fiber-rich plant foods appears particularly protective against both gastrointestinal and neurological disorders [13].

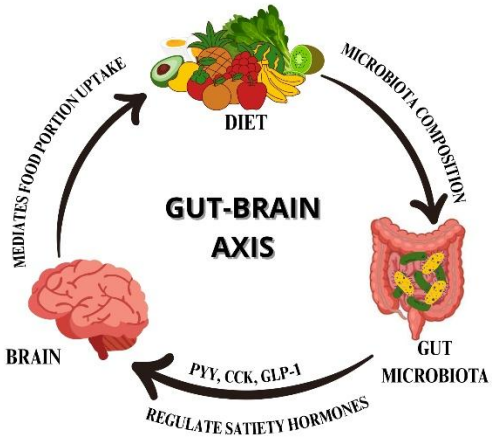

Figure 2: Gut-Brain Axis Signaling in Dietary Satiety Regulation

SUPPLEMENTS AND NOOTROPICS

The use of dietary supplements and nootropics for the purpose of enhancing cognitive function has really caught the public eye, but the evidence in support of this claim is still quite mixed. Among the most investigated supplements, the ones richest in omega-3 fatty acids, docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), present the most consistent anti-inflammatory and neuroprotective actions. Studies have found that omega-3 supplementation with fish oil is associated with a 16% decrease in C-reactive protein (CRP) levels that implies a reduction of systemic inflammation. Furthermore, a small clinical trial showed that the ingestion of a special supplement with DHA as the only active compound led to the improvement of cognitive performance as well as physical movement of elderly women, which suggests the usefulness of this agent in age-related cognitive problems. Nevertheless, the status of other so commonly advertised nootropics e.g., Ginkgo biloba, is still not clear. Some studies refer to the possible cognitive improvement by taking Ginkgo while others found no effect, for example in the case of multiple sclerosis or cardiovascular health. According to the data from mechanistic research, results have occurred that Ginkgo can cause a change in the gene expression related to neuroplasticity, but there are no results so far in large-scale clinical studies that support these findings. Rather than the issue of supplement efficacy, it is the pharmaceutical quality and bioavailability that really decide the effectiveness of a supplement. For example, comparing a study has shown that Ginkgo absorption was vastly different across brands, most likely due to the differences in the rates of dissolving and standardizations of extracts. This dissimilarity makes it clear that the highest control of the quality of herbal preparations should be maintained [14]. In the same way, while creatine and phosphatidylserine exhibit some hope for being effective in memory enhancement based on small studies, this effect is often observed to be dose-dependent and, moreover, it is not always possible to assume the same effect in all populations. The subject of safety and risk factors complicates the issue of supplement use. For instance, intake of high-dose omega-3 may raise the risk of bleeding in anticoagulated patients, and some herbal nootropics marketed outside the regulated market could be the cause of interactions with prescription medications. In addition to the above, the quality of the present-day knowledge is poor due to the short duration and the different participant populations used in the studies. Therefore, longer, randomized controlled trials (RCTs) have to be carried out in order to provide the most conclusive evidence. To sum up, while several supplements like omega-3s have been proven to make a positive impact on brain health, many others are not well-grounded in either sound evidence or consistent

quality. Doctors and patients have to give preference to those methods, which are based on sound evidence, and should also pay attention to the third-party tested products and disregard the assertions that are not supported by evidence. Succeeding studies should direct their effort at standardized formulations, observing biomarker-driven outcomes and making use of personalized approaches to identify responders [15].

SPECIAL POPULATIONS AND LIFE STAGES

Optimal brain health requires different nutritional approaches throughout the lifespan, with docosahexaenoic acid (DHA) and other omega-3 fatty acids playing a particularly vital role from infancy to old age. During early neurodevelopment, breast milk serves as the ideal source of essential fats, including DHA and other long-chain polyunsaturated fatty acids (LC-PUFAs), which are strongly associated with improved cognitive, motor, and visual development in infants. The composition of breast milk, however, varies significantly depending on maternal diet and ethnicity. For example, studies show that Asian mothers in New Zealand who consume higher amounts of fish and plant-based fats have significantly greater concentrations of PUFAs in their breast milk compared to other ethnic groups. This highlights the importance of tailored nutritional guidance for mothers, particularly in regions where omega-3-rich foods are less accessible. In older adults, omega-3 fatty acids continue to play a neuroprotective role. Research indicates that higher levels of eicosapentaenoic acid (EPA) and a favorable omega-3 index are linked to better episodic memory, processing speed, and preserved brain structure, including greater white matter volume and a thicker entorhinal cortex. These findings suggest that omega-3 supplementation may help delay age-related cognitive decline.Beyond omega-3s, other nutrients-such as antioxidants (vitamins C and E), high-quality protein, and dietary patterns like the Mediterranean diet-also contribute to brain health by reducing oxidative stress and supporting synaptic function. For instance, adherence to a Mediterranean diet, rich in omega-3s and polyphenols, has been shown to significantly slow cognitive decline in aging populations. While DHA and EPA remain central to brain health across all life stages, a holistic approach-incorporating diverse nutrients and dietary strategies-is essential for optimizing cognitive function and neuroprotection. Future research should focus on personalized nutrition to address individual variability in dietary needs and responses [16].

PRACTICAL STRATEGIES FOR IMPLEMENTING BRAIN-BOOSTING DIETS

Adopting brain-healthy eating patterns requires addressing socioeconomic, cultural, and practical barriers through evidence-based approaches. Meal planning emerges as a foundational strategy, with research demonstrating that individuals who regularly plan meals consume significantly more fruits, vegetables, and whole grains compared to non-planners. This practice proves particularly valuable for time-constrained populations like shift workers, where advance meal preparation correlates with improved dietary quality and cognitive performance. Financial constraints need not preclude brain-healthy nutrition. Strategic food selection can maximize nutrient density while minimizing costs - canned sardines provide omega-3 fatty acids comparable to fresh salmon at a fraction of the price, while frozen berries offer antioxidant levels similar to fresh varieties. Eggs serve as an economical source of choline, with studies linking regular consumption to enhanced memory function in older adults. Cultural food traditions should be enhanced rather than replaced [17]. Successful interventions adapt traditional eating patterns by incorporating neuroprotective elements - adding walnuts to customary baked goods or substituting whole grain versions of staple carbohydrates. This approach has shown particular success in Mediterranean populations, where maintaining traditional diets while emphasizing specific components like extra virgin olive oil yields measurable cognitive benefits. Environmental modifications significantly influence food choices. Simple adjustments like placing fruits and vegetables in visible locations increase consumption, while workplace interventions providing healthy cafeteria options improve employees' dietary patterns and concentration. Community programs, including farmers' markets and urban gardens, enhance access to fresh produce in underserved areas [18]. Technology-enabled solutions are expanding access to personalized nutrition. Mobile applications providing tailored dietary recommendations demonstrate improved adherence to brain-healthy patterns, though they work best when complementing fundamental nutrition education. Behavioral strategies like implementation intentions ("if-then" planning) and framing dietary changes as additions rather than restrictions prove more sustainable than restrictive approaches. Healthcare providers play a pivotal role through targeted nutrition counseling during clinical encounters. Community-based programs combining education with practical skills development, led by culturally representative educators, show particular effectiveness across diverse populations. These individual and community-level strategies must be supported by policy changes - from nutrition assistance programs to zoning regulations - that create environments conducive to brain-healthy eating. The most effective interventions combine scientific evidence with cultural relevance and practical feasibility. Future research should focus on real-world implementation studies to identify optimal strategies for different populations, ensuring the cognitive benefits of nutrition science become accessible to all [19].

CONCLUSION

The growing body of evidence underscores that nutrition plays a pivotal role in brain health, influencing cognitive function, neuroprotection, and the risk of neurodegenerative diseases. From essential micronutrients like omega-3 fatty acids and B vitamins to dietary patterns such as the Mediterranean and MIND diets, research consistently demonstrates that optimal nutrition can enhance memory, reduce inflammation, and slow cognitive decline. However, translating these findings into real-world practice requires addressing

socioeconomic barriers, cultural preferences, and practical challenges through meal planning strategies, budget-conscious food choices, and policy level interventions. While promising, the field still necessitates further high-quality clinical trials to refine dietary recommendations and explore personalized nutrition approaches. Ultimately, integrating brain-boosting foods into daily diets supported by public health initiatives and technological advancements offers a powerful, accessible strategy for preserving cognitive health across the lifespan. Future research should prioritize longitudinal studies and equitable interventions to ensure these benefits reach diverse populations.

DECLARATIONS

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Availability of data and material
This is a review article, and no original research data were generated. All data and material reviewed are available in the cited publications.

Competing interests
The authors declare no competing interests.

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Authors' contributions
Dharani Ashok Kumar conceived the review framework and coordinated the literature synthesis on dietary patterns. Prithippa Sasikanth analyzed micronutrient mechanisms and contributed to manuscript drafting. Arthi Suresh Kumar investigated gut-brain axis interactions and clinical evidence curation. Karthik Thiyagarajan interpreted data, designed visual elements, and revised intellectual content. Ragesh Gurumoorthi supervised the project, validated translational insights, and finalized the manuscript, with all authors approving the final version.

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LIST OF ABBREVIATIONS

- **AD** – Alzheimer's Disease
- **AI** – Artificial Intelligence
- **BBB** – Blood-Brain Barrier
- **BDNF** – Brain-Derived Neurotrophic Factor
- **CNS** – Central Nervous System
- **CRP** – C-Reactive Protein
- **CVD** – Cardiovascular Disease
- **DASH Diet** – Dietary Approaches to Stop Hypertension
- **DHA** – Docosahexaenoic Acid
- **DNA** – Deoxyribonucleic Acid
- **EPA** – Eicosapentaenoic Acid
- **EVOO** – Extra Virgin Olive Oil
- **GABA** – Gamma-Aminobutyric Acid
- **GI** – Glycemic Index
- **LC-PUFAs** – Long-Chain Polyunsaturated Fatty Acids
- **MCI** – Mild Cognitive Impairment
- **MIND Diet** – Mediterranean-DASH Intervention for Neurodegenerative Delay
- **PREDIMED** – *Prevención con Dieta Mediterránea*
- **PUFAs** – Polyunsaturated Fatty Acids
- **RCTs** – Randomized Controlled Trials
- **RNA** – Ribonucleic Acid
- **ROS** – Reactive Oxygen Species
- **SCFAs** – Short-Chain Fatty Acids

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