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Review Article

Neuronutrition-the Link Between Diet and Cognitive Adaptability

Shalini Jangra*, Monika Choudhary, Nirja Saikia, Prabhdeep Kaur, Shristi Singh

Department of Food and Nutrition, Punjab Agricultural University, Ludhiana, India

Abstract

Objective: The purpose of this study is to look at the burgeoning topic of neuronutrition within nutritional neuroscience, specifically how dietary factors affect brain health, cognitive adaptation, and susceptibility to neurological illnesses across the lifetime. *Review framework:* This narrative review brings together current information from nutritional neuroscience, clinical trials, and epidemiological investigations to investigate the link between macronutrients, neurobiological mechanisms, and cognitive outcomes. The framework brings together molecular, physiological, and behavioural aspects to provide a thorough knowledge of diet-brain interactions. *Principle Theme:* The review emphasises the importance of key nutrients such as proteins, carbs, fats (especially omega-3 fatty acids), vitamins, minerals, and phytonutrients in regulating brain chemistry, neurotransmitter production, neuroplasticity, and cognitive function. Core molecular pathways such as neuroinflammation, oxidative stress, and mitochondrial dysfunction are investigated in relation to neurological illnesses like Alzheimer's disease, depression, and others. The gut-brain axis is described as a bidirectional communication system that influences mood and cognition via microbial metabolites, immunological signalling, and neurotransmitter synthesis. Hormonal imbalances and gene-environment interactions are also being investigated as modulators of neurogenesis and disease vulnerability, with potential ties to metabolic illnesses such as type 2 diabetes. Nutrient deficiencies, including protein, essential fatty acids, iron, zinc, iodine, and vitamin B12, have been linked to brain growth and cognitive decline. *Conclusion:* Neuronutrition offers a multidisciplinary approach for examining how dietary habits influence neuronal integrity and cognitive resilience. The evidence supports the creation of specific dietary therapies aiming at improving brain health, reducing neuroinflammation, and lowering the global prevalence of neurological and metabolic illnesses. Future research should focus on mechanistic clarity and translational techniques to improve cognitive health in varied populations.

Keywords

Neuronutrition, Nutritional Neuroscience, Brain Health, Cognitive Function, Neuroinflammation

1. Introduction

Neuronutrition is a new and dynamic discipline that emphasises the strong link between diet and brain health across the lifespan. Proper diet has a significant impact on brain development, neurochemistry, and long-term cognitive consequences be-

*Correspondence: Shalini Jangra (shalini19961211@gmail.com)

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ginning during the prenatal period. The brain, as the primary regulator of physical activities and energy metabolism, requires a steady supply of various nutrients to sustain memory, learning ability, emotional equilibrium, and overall mental functioning. Instead, than relying on a single item, good brain function requires a well-balanced diet rich in important macronutrients, micronutrients, and phytonutrients. Cognitive adaptability can be defined as the brain's ability to modify cognitive strategies and behavioural reactions in response to changing environmental demands. It is closely related to cognitive flexibility and executive control processes. With the global rise of neurological disorders such as Alzheimer's disease, cognitive decline, and mental fatigue, neuronutrition provides a preventive and therapeutic approach based on nutritional neuroscience, which investigates how dietary components affect the central and peripheral nervous systems, behaviour, and cognition. This interdisciplinary field combines nutrients, dietary patterns, functional foods, nutraceuticals, and healthy eating habits in order to protect and improve brain function. It also acknowledges the role of cultural eating practices and food settings in determining dietary habits and neurological health. Neuronutrition promotes scientifically developed meals, healthy living choices, and clean and balanced eating environments as a proactive strategy for preventing neurological illnesses and improving cognitive resilience. Finally, it emphasises the idea that food is not only fuel for the body, but also necessary nourishment for the brain, with enormous potential to improve mental health and quality of life at all stages of life.

The study's goal is to summarise the most recent research findings and provide an explanation of how dietary choices can enhance neurological health, cognitive function, and brain function throughout life. The study emphasises the promise of diet-based interventions for enhancing cognitive agility, avoiding neurological illnesses, and supporting long-term brain health by combining results from nutritional science and neuroscience.

2. Methodology of the Review

A comprehensive literature search was carried out to identify relevant peer-reviewed studies on neuronutrition and cognitive adaptation. We examined electronic databases such as PubMed, Scopus, Web of Science, and Google Scholar for papers published between 2000 and 2024.

Following keywords and combinations were used:

"Neuronutrition"

“Diet and cognitive function”

“Nutrition and brain plasticity”

“Cognitive adaptability”

“Gut–brain axis”

“Omega-3 fatty acids and cognition”

“Polyphenols and neuroprotection”

“Micronutrients and brain function”

3. Methodology

There are various internal and external factors which affects the brain development and activity of brain. Neuroinflammation, oxidative stress, Gut brain axis, Hormonal imbalance these are some of the factors that affect the brain development and leads various problems.

4. Internal and External Factor That Affects the Brain Health and Activity

Neuroinflammation - Alzheimer's disease, Parkinson's disease, multiple sclerosis, stroke, depression, and other neurodegenerative and neuropsychiatric disorders are all influenced by neuroinflammation, a complex immune-mediated inflammatory response in the central nervous system (CNS) [1, 36]. A resident microglia and astrocytes interact dynamically with peripheral immune signals during ageing, infection, trauma, ischaemia, metabolic disorders, and systemic inflammation in the brain, which was once thought to be an immune-privileged organ [3, 63]. The release of pro-inflammatory cytokines, chemokines, and reactive oxygen species by activated microglia in response to pathogenic stimuli or neuronal injury is crucial for tissue repair and host defence; however, prolonged or dysregulated activation causes oedema, peripheral immune cell infiltration, disruption of the blood–brain barrier, and progressive neuronal damage [19, 38]. Through microglial priming, which is defined by increased sensitivity and exaggerated inflammatory responses to secondary insults, ageing further exacerbates neuroinflammation and increases vulnerability to neurodegeneration [21, 58]. Prolonged neuroinflammatory signalling has been linked to several neurodegenerative diseases, including mitochondrial dysfunction, impaired protein degradation, axonal transport abnormalities, apoptosis, and hallmark pathological mechanisms like tau hyperphosphorylation and β-amyloid plaque accumulation in Alzheimer's disease [2, 45]. The difficulty of finding therapeutic targets that selectively reduce harmful inflammation while maintaining vital immune functions within the central nervous system is highlighted by the fact that, even though inflammatory mediators support normal synaptic plasticity and neural repair, excessive suppression of these pathways may impair adaptive and regenerative processes [1, 65].

Oxidative stress: - An imbalance between the antioxidant defence system and the excessive production of reactive oxygen species (ROS) and reactive nitrogen species (RNS) causes oxidative stress, a complex biological process that damages cells and molecules. A major target in neurological and psychiatric disorders, the brain is especially vulnerable to oxidative stress because of its high oxygen consumption, abundance of polyunsaturated fatty acids, elevated iron content, and relatively limited antioxidant capacity [34, 13]. There is growing evidence that oxidative stress contributes to both structural and functional brain impairments in neurodegenerative diseases like Alzheimer's and Parkinson's, as well as mental illnesses like major depressive disorder and psychosis [12, 48]. Particularly susceptible areas of the brain include the hippocampus and amygdala because hippocampal neurones have a high metabolic demand and weakened antioxidant defences, which hinder neurogenesis and raise neuronal death in oxidative environments [48]. Oxidative stress accelerates neuronal degeneration and disease development in neurodegenerative illnesses by aggravating mitochondrial dysfunction, protein misfolding, lipid peroxidation, and DNA damage [34, 60]. By scavenging free radicals and reducing oxidative damage, antioxidant defence systems which include enzymatic antioxidants like glutathione peroxidase, catalase, and superoxide dismutase as well as non-enzymatic dietary antioxidants like vitamins C and E are essential for preserving redox homeostasis [7, 48]. Recent studies emphasize the neuroprotective and therapeutic potential of antioxidants in reducing oxidative stress-induced neuronal death, preserving cognitive function, and potentially delaying the onset and progression of neurodegenerative diseases, highlighting their importance in preventive and therapeutic strategies targeting oxidative stress-related brain damage [32].

Gut-Brain axis: - Through the gut–brain axis, which combines neurological, endocrine, and immunological pathways, the gut microbiota communicates with the brain in both directions and plays a crucial role in controlling emotions and cognitive processes. The vagus nerve, which links the brain to more than 100 million neurones in the enteric nervous system and sends afferent and efferent signals via sympathetic and parasympathetic pathways, is essential to this communication. It affects mood, stress reactions, and cognitive function [16, 17]. Neurotransmitters and neuroactive metabolites like gamma-aminobutyric acid (GABA), serotonin, dopamine precursors, and short-chain fatty acids are produced by the gut microbiota, which is made up of trillions of microorganisms. These substances affect neuronal signalling, emotional regulation, and cognitive function [55]. Furthermore, neuropeptides such as ghrelin and peptide YY are released by enteroendocrine cells and function as second messengers that affect motivation, learning, memory, and dopamine pathways. In addition to controlling immune and inflammatory responses, the gut microbiota can also contribute to neurodegenerative diseases like Alzheimer's and Parkinson's by promoting systemic inflammation and neuroinflammation through chronic dysbiosis or increased intestinal permeability [18, 63]. For example, omega-3 fatty acids (EPA and DHA) from fish oils boost neuronal membrane integrity and synaptic plasticity, which improves learning and memory processes. Proper nutrient absorption in the stomach is crucial for optimal brain function [36]. Probiotics and prebiotics may improve cognition by modulating neurotransmitter synthesis, improving nutrient bioavailability, and reducing inflammation, highlighting their therapeutic potential in neurological disorders related to the gut-brain axis [40]. Meanwhile, new research indicates that eating a varied, fiber-rich diet supports a healthy gut microbiota, improves cognitive resilience, and lowers the risk of cognitive decline [10, 16].

Hormone Imbalance: - Although the brain and body were traditionally thought of as distinct entities, current research indicates that they are tightly related through hormonal and metabolic mechanisms. Peripheral hormones affect brain shape, neurotransmission, and cognition, while the brain controls hormones through the hypothalamus and pituitary gland. Mood, memory, and general mental health can all suffer when hormonal equilibrium is upset. Cognitive decline, anxiety, and sadness are all associated with hormonal abnormalities. Accordingly, brain health and psychological well-being depend on preserving hormonal balance by appropriate diet, stress reduction, medical care, or hormone therapy [2].

Progesterone and estrogen: - In addition to being reproductive hormones, estrogen and progesterone are important for brain function. In addition to improving synaptic plasticity, neurotransmitter activity, and cognitive functions including memory and learning, estrogen also possesses neuroprotective qualities. Alzheimer's disease and other neurological illnesses may be prevented by it. Additionally, progesterone promotes brain repair and neuronal survival. Hormone variations are linked to mood swings and cognitive loss, especially after menopause. This suggests that hormone therapy may be beneficial in some situations [54, 64].

Thyroid Hormone: - The growth of the brain, metabolism, and neuronal activity all depend on the thyroid hormones T3 and T4. While hyperthyroidism can result in anxiety, impatience, and poor attention, hypothyroidism can induce memory issues, depression, and sluggish cognition. Thyroid problems can change brain shape and cognitive function, especially in older persons, according to research combining clinical and neuroimaging findings. To preserve mental and emotional well-being, thyroid hormone levels must be properly regulated [6, 51].

Cortisol: - The body's stress response is significantly influenced by cortisol, also referred to as the stress hormone. Chronic increase brought on by extended stress, however, can have detrimental effects on the prefrontal cortex and hippocampal regions, which oversee memory and emotional control. Cognitive decline, mood disorders, and memory impairment are linked to persistently elevated cortisol levels. To preserve brain function, effective stress management techniques are consequently crucial [49].

Insulin: - Insulin has an important role in brain function in addition to regulating glucose. Type 2 diabetes is frequently associated with insulin resistance, which has been connected to cognitive decline and an elevated risk of Alzheimer's disease. Neurodegeneration and impaired neural transmission may result from disrupted insulin signaling. These results emphasize how crucial hormonal and metabolic balance is to maintain cognitive health throughout age [15].

Environment and gene interaction: - Environmental variables and genetic factors combine to shape brain development.

While environmental factors including early-life stress, nutrition, and social experiences alter brain function through epigenetic pathways, genes provide the fundamental framework for neural connection and vulnerability to mental diseases [55, 57]. Neuroplasticity, neurogenesis, and cognitive function are all improved by environmental enrichment [4]. While eating a lot of sugar and saturated fat speeds up cognitive decline, a balanced diet full in fruits, vegetables, and omega-3 fatty acids enhances cognitive function [25, 29]. Through oxidative stress, pollutants such as heavy metals affect brain function [30]. Exercise increases resilience and cerebral blood flow [38].

Nutrient Deficiencies: - Nutrients play a vital role in brain health by supporting neurotransmitter synthesis, myelination, energy metabolism, and synaptic plasticity essential for learning and memory. Adequate intake of proteins, essential fatty acids, vitamins, and minerals helps prevent cognitive decline, mood disorders, and neurodevelopmental impairments as shown in Table 1. Long-term cognitive impairment, emotional disorders, developmental delays, and memory loss are all associated with deficiencies [8, 20].

Table 1. *The contribution of nutrients to brain health.*

Nutrient	Major Sources	Recommended Intake	Key Brain Functions	Evidence Type	Key Findings / Effect Pattern	Clinical Relevance	References
Protein	Pulses, cereals, dairy, meat, nuts	46–54 g	Neurotransmitter synthesis, nerve signaling	Observational, clinical nutrition studies	Adequate protein intake associated with better cognitive performance and reduced risk of mild cognitive impairment	Important for maintaining neurotransmitter balance and cognitive function during aging	[62]
Carbohydrates	Whole grains, fruits, vegetables	~120 g	Primary energy source for brain	Observational studies	Low carbohydrate intake linked with reduced psychomotor speed and memory performance	Balanced carbohydrate intake supports sustained cognitive energy metabolism	[45]
DHA & EPA (Omega-3)	Fatty fish, flaxseed, walnuts	~500 mg	Synaptic plasticity, neuronal membrane integrity	RCTs, observational studies	Consistent evidence of improved memory and learning; dosage variability across trials	Potential preventive role in cognitive decline and neurodegenerative disorders	[25]
Vitamin B12	Dairy, fermented foods, sprouts	2.2 µg	Myelin formation, nerve impulse transmission	Observational and clinical studies	Deficiency strongly associated with cognitive decline and depressive symptoms	Screening important in elderly populations	[43]
Vitamin D	Mushrooms, seafood, dairy	400–800 IU	Regulation of neurotrophic factors	Observational studies, emerging trials	Low levels associated with increased risk of dementia and neuropsychiatric disorders	Possible role in neuroprotection but causal evidence still evolving	[4]
Vitamin E	Nuts, seeds, vegetable oils	15 mg	Antioxidant protection of neurons	Observational and intervention studies	Antioxidant effects may slow progression of neurodegenerative diseases	Potential supportive therapy in neurodegenerative conditions	[44]
Magnesium	Nuts, leafy greens, cocoa	370–440 mg	Synaptic transmission, neuroprotection	Mechanistic and observational studies	Deficiency linked with neuroinflammation and impaired synaptic plasticity	May support cognitive resilience and neuronal signaling	[5]
Zinc	Meat, beans, lentils	13–17 mg	Synaptic plasticity and neuronal signaling	Mechanistic and epidemiological studies	Dysregulated zinc homeostasis observed in neurodegenerative disorders	Important for maintaining neuronal signaling pathways	[36]
Polyphenols	Berries,	200–500	Antioxidant and	Experimental and human	Evidence suggests improved memory and	Potential dietary strat-	[59]

Nutrient	Major Sources	Recommended Intake	Key Brain Functions	Evidence Type	Key Findings / Effect Pattern	Clinical Relevance	References
	cocoa, tea	mg	anti-inflammatory activity	trials	cerebral blood flow	egy for cognitive aging prevention	
Psychobiotics	Yogurt, kefir, fermented foods	—	Gut–brain axis modulation	Emerging human trials	May improve mood, stress response, and cognition through microbiota modulation	Promising but still developing area of neuronutrition research	[49]

DHA*: - Docosahexaenoic acid
EPA*: - Eicosapentanoic acid

1) Cognitive decline and the risk of neurodegenerative diseases are associated with deficiencies in omega-3 fatty acids, which are necessary for the integrity of neuronal membranes and synaptic plasticity [22].
2) Low levels of vitamin D are linked to an increased risk of dementia; it also has a role in neuroprotection and cognitive function [4].
3) Myelination and dopamine function depend on iron, and a lack of it in early childhood can result in permanent cognitive impairments [28, 42].
4) Because some nutrients are needed throughout delicate stages of brain development, timing is crucial when it comes to nutrition [28, 15].
5) Gut–brain axis: Dysbiosis is associated with neurodevelopmental problems; gut microbiota affects mood and cognition through immunological and metabolic pathways [16, 14].
6) Long-term cognitive results are substantially predicted by early-life nutrition, which includes breastfeeding and proper supplemental feeding [16].

Precision Nutrient Interventions: - Given that there will likely be 100 million cases of cognitive impairment by 2050, it is imperative that modifiable risk factors like food be addressed. The generation of neurotransmitters, energy supply, and neuroprotection are all directly impacted by nutrition. Better cognitive function and a lower risk of neurodegenerative illnesses are linked to healthy eating habits [23, 24]

1) The brain's main energy source is carbohydrates; complex, low-glycemic index carbs sustain cognitive function and offer consistent energy [12].
2) Omega-3 fatty acids (DHA) are lipids that are necessary for the construction of neuronal membranes and brain function; taking supplements may lower the incidence of dementia and cognitive decline [16].
3) Hormones (Cortisol and Insulin): Chronic stress and high cortisol lead to neurodegeneration; insulin resistance affects memory and cognition [15].
4) Rich in fruits, vegetables, whole grains, seafood, and healthy fats, the Mediterranean diet is associated with improved cognitive function and a decreased risk of cognitive impairment [62].
5) Precision nutrition may improve brain function and stop deterioration by using individualised food plans based on nutritional status and genetics [26].

Table 2. *Summary of various intervention studies which were conducted by various researchers.*

Intervention Nutrient	Duration & Dose	Disease/Condition	Evidence Type	Key Findings / Effect Pattern	Clinical Relevance	References
DHA, EPA	500–600 mg/day (3 weeks–12 months)	Depression, Anxiety	Clinical trials	Significant reduction in depression and anxiety symptoms	Supports use in mood disorder management	[50]
Omega-3 PUFA	840 mg EPA + 560 mg DHA/day (12 months)	Psychotic disorders	Clinical trials	Improvement in psychotic symptoms	May aid as adjunct therapy in psychiatric disorders	[1]
Magnesium, Folic Acid	310 mg Mg + 400 µg folic acid/day (8 weeks)	Stress management	Clinical studies	Positive effect on stress reduction	Useful in stress and mental well-being	[44]
Zinc	50 mg/day (12 weeks)	Depression with	Clinical trials	Reduction in depressive symptoms	May support mental health in	[52]

Intervention Nutrient	Duration & Dose	Disease/Condition	Evidence Type	Key Findings / Effect Pattern	Clinical Relevance	References
		multiple sclerosis			chronic disease	
Vitamin B (B2, B6, B12)	B2: 400 mg/day (3 months); B12: 3 mg + B6: 1 mg/day (12 weeks)	Migraine; Cognitive decline with age	Clinical trials	Reduced migraine frequency; improved cognitive outcomes	Supports neurological function and aging brain health	[11, 53]
Vitamin A	30 mg/day (28 days); 25,000 IU/day (6 months)	Alzheimer's disease; Multiple sclerosis	Clinical studies	Reduction in symptoms and disease progression	Potential neuroprotective role	[46, 20]
Vitamin E	400 IU/day (3 months)	Parkinson's disease	Clinical trials	No significant improvement observed	Limited efficacy in this condition	[33]
Vitamin C	2 g/day (6 months); 500 mg/day (3 months)	Hyperoxia; Trauma recovery	Clinical studies	Reduction in oxidative stress and improved recovery	Supports antioxidant defense and healing	[39, 30]
Coenzyme Q10	300 mg/day (90 weeks)	Parkinson's disease	Clinical trials	Significant improvement in disease progression	Potential therapeutic role in neurodegeneration	[64]
Polyphenols	Cocoa: 250 mg/day (4 weeks); Flavonoids: 17–36 mg/day (3 years)	Mental fatigue; Cognitive function	Human trials	Improved cognition and reduced mental fatigue	Supports cognitive performance and aging	[38, 35]
Prebiotics (FOS)	5 g/day (3 weeks)	Cognitive function, stress	Clinical studies	Improved cognition and reduced stress response	Supports gut–brain axis modulation	[54]
Probiotics (Lactobacillus, Bifidobacterium)	3 weeks (animal); 30 days (human)	Mood, cognition, brain function	Animal and human studies	Improved mood, stress response, and neurotransmitter activity	Promising role in mental health via gut–brain axis	[32, 51]

DHA*: - Docosahexaenoic acid
EPA*: - Eicosapentanoic acid
PUFA*: - Polyunsaturated Fatty Acid
FOS*: - Fructooligosaccharide

Various intervention studies demonstrate that targeted nutritional, lifestyle, and psychosocial strategies significantly enhance cognitive function, emotional well-being, and overall brain health across different age groups. From the Table 2 collectively, these findings highlight that early, personalized, and sustained interventions can slow cognitive decline and promote long-term neuroprotection.

Dietary Neurotransmitter: - Food-derived substances known as dietary neurotransmitters aid in the production and operation of brain neurotransmitters, which in turn affect mood, mental health, and cognitive function. As given in Table 3, turkey, nuts, seeds, and dairy products include amino acids such tryptophan, tyrosine, and phenylalanine, which act as precursors for important neurotransmitters involved in the regulation of emotions and cognition [9, 36].

1) Tryptophan → Serotonin: Supports mood and sleep; higher intake is linked with improved emotional processing [52].
2) Tyrosine and Phenylalanine → Dopamine and Norepinephrine: Enhance attention, motivation, and cognitive performance, especially under stress [14, 37].
3) Fermented foods: Contain probiotics that influence serotonin and GABA production via the gut–brain axis, supporting mood and cognition [41, 56].

Table 3. Common dietary neurotransmitters with their action and source.

Neurotransmitter	Key Actions in Brain	Dietary Sources	Evidence Type	Key Findings / Effect Pattern	Clinical Relevance	References
Acetylcholine	Modulates neuronal excitability, synaptic transmission, and synaptic plasticity	Citrus fruits, beans, peas, spinach, pumpkin	Mechanistic and nutritional studies	Choline-rich diets support acetylcholine synthesis and may enhance memory and learning processes	Important for cognitive function and may influence risk of neurodegenerative disorders such as Alzheimer's disease	[26]
Glutamate	Primary excitatory neurotransmitter; mediates synaptic plasticity and neuronal signaling	Tomato, spinach, paneer, mushrooms, fermented soy products, seafood	Mechanistic and experimental studies	Essential for learning and memory through synaptic plasticity, but excessive activity may contribute to excitotoxicity	Balanced glutamate signaling is critical for normal cognition and prevention of neuronal damage	[48]
GABA	Major inhibitory neurotransmitter regulating synaptic activity and circadian rhythm	Barley, broccoli, buckwheat, oats, soybean, spinach, tea	Experimental and emerging clinical studies	GABA-modulating foods may promote relaxation and stress regulation	Potential role in managing anxiety, sleep disorders, and stress-related cognitive impairment	[31]
Dopamine	Regulates motor control, motivation, cognition, and reward pathways	Banana, avocado, tomato, spinach, legumes	Mechanistic and observational studies	Dopamine precursor nutrients (e.g., tyrosine) influence motivation and cognitive performance	Dysregulation linked with Parkinson's disease and mood disorders	[58]
Serotonin	Regulates mood, sleep, anxiety, and metabolic processes	Kiwi, banana, pineapple, tomato, nuts	Observational and mechanistic studies	Tryptophan-rich foods influence serotonin synthesis and emotional regulation	Important in depression, sleep disorders, and gut–brain axis regulation	[19]
Histamine	Regulates sleep–wake cycle, learning, memory, appetite, and neuroendocrine functions	Fermented foods, aged cheese, yogurt, fish products	Mechanistic and clinical studies	Histamine signaling influences alertness and cognitive arousal	Altered histamine signaling may contribute to sleep disorders and cognitive dysfunction	[47]

5. Conclusion

A paradigm shift known as neuronutrition solidifies eating as a dynamic regulator of cognitive flexibility and long-term brain health. Certain nutrients have a direct impact on neuroplasticity, neurotransmitter production, synaptic efficiency, and resistance to neurodegenerative diseases in addition to providing basic nutrition. The complex relationships between neuroinflammation, oxidative stress, the gut-brain axis, hormonal signalling, gene-environment regulation, and micronutrient status demonstrate how nutritional physiology is closely linked to brain function. It is clear from incorporating knowledge from nutritional neuroscience that specific dietary approaches can improve neural resilience, emotional stability, and cognitive flexibility. Neuronutrition has great potential for developing therapeutic and preventive dietary therapies that maintain cognitive function and lessen the impact of neurological illnesses as scientific research progresses. In the end, eating a healthy, nutrient-dense diet improves overall quality of life, maximises cognitive flexibility, and fortifies brain integrity in addition to just keeping the body healthy.

Abbreviations

DHA	Docosahexanoic Acid
EPA	Eicosapentanoic Acid
GABA	Gamma Amino Butyric Acid
CNS	Central Nervous System
ROS	Reactive Oxygen Species
RNS	Reactive Nitrogen Species

Author Contributions

Shalini Jangra: Conceptualization, Data curation, Investigation, Methodology, Resources, Software, Visualization, Writing – original draft, Writing – review & editing

Monika Choudhary: Formal Analysis, Project administration, Supervision, Validation

Nirja Saikia: Writing – review & editing, Investigation

Prabhdeep Kaur: Writing – review & editing, Investigation

Shristi Singh: Writing – review & editing, Investigation

Conflicts of Interest

The authors declare no conflicts of interest.

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