

Brain Health and Alzheimer's Natural Integrative Approaches

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Abstract

Alzheimer's disease is a growing global public health concern, affecting millions of individuals worldwide and imposing substantial emotional, social, and economic burdens on patients, caregivers, and healthcare systems. As population aging continues to accelerate, the prevalence of Alzheimer's disease is expected to rise, underscoring the increasing importance of strategies aimed at preserving cognitive function and delaying disease onset. Evidence suggests that Alzheimer's disease is multifactorial in nature, with contributions from genetic predisposition, lifestyle choices, and environmental exposures. Importantly, many of these factors are modifiable, providing a critical opportunity for early intervention. Integrative and holistic approaches including targeted nutrition, regular physical activity, cognitive and mind-body therapies, sleep optimization, and selected herbal or natural supplements have demonstrated potential in supporting neuroplasticity, reducing oxidative stress, and enhancing overall brain resilience. Nutritional patterns such as the Mediterranean and MIND diets, combined with routine aerobic and resistance exercise, ongoing mental stimulation, meditation, and adequate sleep, may play a meaningful role in maintaining cognitive health. Additionally, certain natural compounds may offer complementary neuroprotective benefits. While limitations in study design and variability in evidence quality warrant cautious interpretation, holistic interventions can serve as valuable adjuncts to conventional medical care. Personalized, lifestyle-based strategies hold promise for reducing Alzheimer's disease risk, supporting cognitive well-being, and improving quality of life for both patients and caregivers, while also contributing to broader public health efforts aimed at mitigating the growing burden of neurodegenerative disease.

Brain Health and Alzheimer's Natural Integrative Approaches

Alzheimer disease is a worldwide health issue that continues to pose a significant threat to millions of people and has been economically, socially, and emotionally very burdening to patients, caregivers, and health care services across the world. Alzheimer's disease is projected to be more prevalent as the life expectancy grows, which means that effective strategies that promote cognitive health and quality of life are highly needed. The issue of brain health is becoming a lifelong concern, which is determined by biological, behavioral and environmental influences and can occur during early life and up to old age. To address this realization, there has been increased interest in the integrative and holistic model of health in which both prevention, resilience, and whole-person care are found to

complement the traditional methods of medicine. These strategies are built on the multi-dimensional aspects of health, which can affect cognitive aging, such as behavioral lifestyles and psychosocial well-being. This paper discusses the emerging literature on holistic brain health approaches and analyzes how these approaches could be used to aid cognitive performance and well-being in the face of Alzheimer disease.

Background and Rationale for Integrative Brain Health Approaches

Alzheimer is a complicated disorder that is a result of multiple factors that include genetic elements and environmental and lifestyle influences. The presence of amyloid-B, hyperphosphorylated protein, oxidative stress, and chronic inflammation of the brain are some of the pathological changes that lead to progressive cognitive and neuronal losses. Traditional approaches to pharmacological treatment are mostly based on symptom treatment instead of treatment of underlying multifactorial processes, which explains the requirement of complementary interventions aimed at alterable risk factors (Nguyen et al., 2023). Integrative methods of both biological and psychosocial brain health with the focus being laid on lifestyle changes, mind-body therapy, or natural substances that have a potential in improving cognitive resilience (Sri et al., 2025). There is evidence to indicate that lifestyle changes, such as a structured diet, physical exercise, stress management, and brain stimulation, can affect neuroplasticity and vascular implementation, and metabolism, potentially causing later delay in disease development or progression (Wang et al., 2025). In addition, the synergies between natural compounds and behavioral and environmental interventions could cause the synergistic outcome on the neuron protection and functional outcomes. This multidimensional approach of dealing with Alzheimer disease acknowledges the interaction of the physiology of the brain and daily routine, thus highlighting the value of the holistic approach as a form of supportive intervention. These strategies present the justification to investigate natural, integrative and lifestyle based interventions with conventional care of people at risk or with Alzheimer in the case of Alzheimer disease.

Evidence-Informed Natural and Holistic Support Strategies

Nutritional Patterns and Dietary Interventions

Diet plays a significant role in how the mind works and there are certain patterns of dietary habits that have been found to guard against Alzheimer disease (AD). The AD risk and slower cognitive decline have been linked to the Mediterranean and MIND diet that is high in fruits, vegetables, whole grains, nuts, and healthy fats (Liu et al., 2025). These diets confer antioxidants, polyphenols, and omega-3 fatty acids that fight the oxidative stress and neuroinflammation which are major pathological challenges in AD (Xu Lou et al., 2023). According to clinical trials and systematic reviews, nutraceuticals, such as curcumin, resveratrol, and flavonoids, could also improve the neuronal protection by working on amyloid aggregation, oxidative damage, and facilitate synaptic functioning (Reza-Zaldívar and Jacobo-Velázquez, 2023; Bayo Jimenez et al., 2025). Incorporating such dietary interventions into a routine life could be a practicable and maintainable program in maintaining brain resilience to accompany the traditional therapy.

Physical activity and cognitive engagements

Physical exercise enhances blood flow to the brain, neuroplasticity, and metabolic and cardiovascular well-being, all of which are preventive measures against cognitive decline (Szabo-Reed and Key, 2025). The aerobic, and resistance exercises have been associated with the enhancement of memory, executive functions and attention of mildly impaired and early-stage AD (Chen et al., 2025). Additional cognitive activity in the form of puzzles, acquisition of new abilities, or even social interaction also contributes to neurocognitive reserve, which leads to age-related neuronal death resiliency (Martínez-López et al., 2024). Evidence on exercise and natural substance combination suggests that the combination may produce a synergetic effect that may enhance neuroprotective capabilities and functional skills (Chen et al., 2025).

Mind-Body Practices and Stress Regulation

Chronic psychological stress and prolonged elevations in cortisol have been strongly associated with hippocampal atrophy and impaired cognitive performance both hallmark features observed in Alzheimer's disease (AD) and age-related cognitive decline. The

hippocampus plays a central role in memory formation, learning, and emotional regulation, making it particularly vulnerable to the neurotoxic effects of sustained stress exposure. Mind-body interventions such as mindfulness meditation, yoga, and Tai Chi have demonstrated measurable benefits in reducing perceived stress, lowering cortisol levels, and improving emotional regulation. Emerging evidence suggests that these practices may enhance neuroplasticity, preserve hippocampal volume, and support executive function and memory in older adults (Ornish et al., 2024). In addition to their neurocognitive effects, mind-body practices positively influence autonomic nervous system balance by increasing parasympathetic activity and reducing chronic sympathetic overactivation, which is often elevated in neurodegenerative conditions. Beyond direct neurological benefits, these interventions address key psychosocial risk factors associated with Alzheimer's disease, including depression, anxiety, social isolation, and sleep disturbances. By fostering mental resilience, emotional stability, and stress adaptability, mind-body practices contribute to overall cognitive sustainability and quality of life. When incorporated into a comprehensive, integrative care model, these low-risk, accessible interventions may serve as valuable adjuncts to conventional prevention and management strategies for Alzheimer's disease and cognitive aging.

Sleep and Circadian Health

Healthy, restorative sleep plays a critical role in maintaining brain homeostasis through activation of the glymphatic system, a specialized waste-clearance pathway responsible for removing β -amyloid, tau proteins, and other neurotoxic metabolic byproducts from the brain. Glymphatic activity is most efficient during deep, slow-wave sleep, when interstitial spaces within the brain expand, allowing cerebrospinal fluid to more effectively flush accumulated waste. Disruption of this process can result in the progressive accumulation of β -amyloid plaques, a defining pathological hallmark of Alzheimer's disease (AD). Abnormal sleep patterns—including short sleep duration, fragmented sleep, insomnia, circadian rhythm disruption, and sleep disorders such as obstructive sleep apnea have been consistently associated with early cognitive changes and increased AD pathology, even prior to the onset of overt clinical symptoms (Martínez-López et al., 2024). Importantly, sleep disturbances are not only a consequence of neurodegeneration but may also act as an early driver of disease progression by exacerbating neuroinflammation, oxidative stress, and synaptic dysfunction. Establishing regular sleep-wake cycles, optimizing sleep hygiene, and identifying and managing underlying sleep disorders are therefore essential components of a holistic brain-health strategy. Interventions such as maintaining consistent bedtimes, minimizing light and electronic exposure in the evening, supporting circadian rhythm alignment, and addressing sleep-disordered breathing can enhance sleep quality and glymphatic efficiency. When integrated with nutritional, physical, and cognitive interventions, sleep optimization represents a foundational and modifiable factor for supporting long-term cognitive resilience and reducing Alzheimer's disease risk.

Complementary Therapies and Herbal Therapies

A broad range of herbal extracts and naturally derived compounds has demonstrated potential cognitive-enhancing and neuro-protective effects, largely attributed to their antioxidant, anti-inflammatory, and neurotrophic properties. Phytochemicals found in rosemary diterpenes, *Ginkgo biloba*, and *Bacopa monnieri*, among other botanicals, have been shown to modulate oxidative stress, attenuate neuroinflammation, and support neuronal signaling pathways that are critical for learning, memory, and executive function (Abbaoui et al., 2024; Bhat et al., 2022; Thawabteh et al., 2025). These mechanisms are particularly relevant in the context of neurodegenerative diseases such as Alzheimer's disease, where chronic inflammation, mitochondrial dysfunction, and synaptic loss contribute to progressive cognitive decline. Systematic reviews and randomized controlled trials suggest that supplementation with selected botanical extracts may lead to modest improvements in memory performance, attention, processing speed, and executive functioning, particularly in older adults and individuals experiencing mild cognitive impairment (Ahmad et al., 2023). Notably, the greatest benefits appear to occur when herbal interventions are combined with foundational lifestyle strategies, including balanced nutrition, physical activity, cognitive engagement, stress management, and sleep optimization, underscoring the importance of a multimodal, integrative approach to brain health. Despite these promising findings, the overall quality of evidence remains limited by small sample sizes, variability in extract standardization, dosing inconsistencies, and short intervention durations. As a result, conclusions regarding long-term efficacy and safety must be interpreted with caution. Larger, well-designed clinical trials with standardized formulations and longer follow-up periods are necessary to better define therapeutic potential, optimal dosing strategies, and safety profiles across

diverse populations (Bayo Jiménez et al., 2025). Until such data are available, herbal and natural compounds should be viewed as complementary strategies rather than standalone treatments within a comprehensive, evidence-informed framework for cognitive health.

Limitations, Ethical Considerations, and Research Gaps

Although natural, integrative strategies of brain health support are promising, a number of limitations have to be taken into consideration. Numerous studies have small sample sizes, limited follow-up, or varied intervention regimens thus it is hard to arrive at conclusive results regarding the effectiveness in the end. Some preclinical or in silico research frequently shows evidence behind some herbal and nutraceutical interventions but does not allow direct translation into clinical practice (Abbaoui et al., 2024; Bhat et al., 2022). Secondly, diversity of the size of the research and the methodology used by different trials makes them subject to divergent results (Hoang et al., 2025). Ethical guidelines also influence the process of prescribing complementary therapies, such as making sure that they are safe, not interacting with traditional medicines, and presenting them with appropriate accuracy to patients and their caretakers (Nguyen et al., 2023). Future studies need to focus on structured, big randomized controlled studies, standard intervention curriculum, and combined lifestyle and natural substance methodologies. These gaps will be addressed to enhance the evidence base and to inform safe incorporation of holistic strategies during the comprehensive care of Alzheimer.

Public Health and Holistic Care Model Implications

The inclusion of natural and lifestyle-based approaches to the management of Alzheimer's in its care is huge towards the health of the people in general. Holistic interventions, such as dietary changes, physical exercises, meditation, and complementary medicine, provide affordable and easy to adopt strategies of maintaining cognitive functions and increasing quality of life in those at risk of having Alzheimer or living with the disease (Sri et al., 2025; Wang et al., 2025). These are interventions that can be tailored to community and cultural concerns, encouraging participation and compliance and that psychosocial requirements are met (Martínez-López et al., 2024). Education, caregiver services in addition to community-based lifestyle programs might decrease the nanouncultured loss across a population. Complementing traditional medical services and care, holistic interventions offer a multidimensional approach within which health care focuses on prevention and cognitive strength, as well as on long-term well-being.

In conclusion, Alzheimer disease is a major problem in world health and the existing pharmacological treatment is only partially effective in preventing the onset of cognitive deficit. Findings of clinical trials, systematic reviews, and mechanistic research indicate the promise of natural, integrative, and lifestyle-based interventions to improve brain functionality and accelerate cognitive fortitude. The Mediterranean and MIND diets offer antioxidants and anti-inflammatory agents which keep the neurons active and healthy, whereas routine exercise and brain stimulation offer neuroplasticity and functional activity. Mind-body and quality sleep regulate psychosocial and physiological variables that contribute to the extent of disease and complementary herbal therapy can provide further neuroprotective advantages when used in a safe and adequate manner. Despite study design and long-term evidence limitations, they are viable multidimensional methods that can be used alongside conventional care. Communities and health care systems can improve brain health, enhance life quality, and decrease the Alzheimer disease burden in society by engaging in integrative solutions based on the needs of people.

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