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ALZHEIMER'S ASSOCIATION

DEMENTIA RISK
REDUCTION

DIET, NUTRITION AND COGNITION: EAT WELL, LIVE WELL

The Public Health Center of Excellence on Dementia Risk Reduction coordinates risk reduction efforts and helps public health agencies share best practices. The Center translates the latest science on dementia risk reduction into actionable tools, materials and messaging that public health agencies can use to reduce dementia risk for all people — including those in diverse, underserved and higher-risk communities.

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DIET, NUTRITION AND COGNITION

WHAT IS ALREADY KNOWN

Diet directly and indirectly influences cognitive health. This influence occurs particularly through nutrition, which is the process by which the body takes in and uses food for growth, repair, and maintenance. Key nutrients that support cognitive function include antioxidant vitamins (such as vitamins E, A, and C, as well as carotenoids), bioactive compounds (such as flavonoids and polyphenols), B vitamins, fiber, healthy fats (including omega-3 and monounsaturated fatty acids), and essential minerals.

For overall optimal health, United States Dietary Guidelines and the American Heart Association recommend a dietary pattern centered on plant-based foods such as vegetables, whole fruits, whole grains, nuts and seeds, plant-based sources of protein such as beans and legumes, and unsaturated vegetable oils. The recommendation is also to minimize or avoid consumption of red and processed meats, excess sodium, saturated fats, added sugars, refined grains, highly processed foods, and excess alcohol. This dietary approach is also associated with cognitive health and aligns with popular dietary patterns, such as the Mediterranean-style and Nordic (Scandinavian-style) diets, both of which have demonstrated positive effects on cognitive health. The World Health Organization (WHO) recommends the Mediterranean diet for adults with normal cognition or mild cognitive impairment as part of a strategy to help slow cognitive decline and dementia.

BACKGROUND AND EVIDENCE BASE

Evidence of an association between diet, nutrition and cognitive health

The exact mechanism between diet and cognition is not fully understood; however, these nutrients and bioactive compounds may help maintain neuronal health, support endothelial and mitochondrial function, preserve blood–brain barrier integrity, and modulate anti-inflammatory and oxidative stress pathways, all of which are important for brain health outcomes. Additionally, diet plays a crucial role in managing cardiovascular risk factors — such as diabetes, dyslipidemia, hypertension, and obesity — that are linked to cognitive decline.

Research on diet and cognition is complex due to challenges such as isolating the effects of individual nutrients and noting a person's dietary pattern using detailed validated dietary assessment tools and considering various social, economic, cultural, and

geographical influences. Randomized controlled trials (RCTs) on dietary interventions are also difficult to conduct. Most studies in this field are observational, assessing the long-term relationships between nutrition and cognition or change in cognition over time with age.

Recent systematic reviews show that adherence to healthy dietary patterns is associated with better cognitive performance, slower cognitive decline, and reduced dementia risk. In contrast, unhealthy dietary patterns are linked to poorer cognitive outcomes. Further research is needed to better understand the specific effects of diet on dementia development and its different forms. This includes exploring how diet may interact with other lifestyle factors, such as physical activity and sleep. It is also important to incorporate culturally relevant dietary patterns and to study populations across the full spectrum of cognitive function. Future studies should include younger individuals and more ethnically and geographically diverse groups to ensure findings are broadly applicable.

Evidence for an association between single nutrients, food groups and cognition

Recent reviews have evaluated the impact of individual nutrients and food groups on cognitive health. While studies on isolated nutrients often yield mixed results, some evidence supports the beneficial role of B vitamins, vitamin E, omega-3 fatty acids, and other antioxidants including carotenoids, and flavonoids, in protecting cognitive function. However, experts agree that the best approach is to obtain nutrients from whole foods, not supplements.

Research highlights the importance of a nutrient-rich diet, emphasizing whole foods and beverages that support cognitive health. The WHO strongly advises against using supplements as a preventive strategy for cognitive decline, citing insufficient evidence for benefit. While multivitamins may show some promise, they are not as effective as obtaining nutrients directly from food. The Alzheimer's Association similarly does not recommend any vitamin, mineral, herbal supplement, or medical food for the prevention or treatment of Alzheimer's or other dementias, due to a lack of consistent clinical evidence.

Evidence for an association between dietary patterns and cognition

A growing body of evidence shows that balanced eating patterns, rather than focusing on individual nutrients or

foods, are associated with better cognitive health. This highlights the cumulative benefits of adopting a varied, nutrient-dense diet. The USDA's Nutrition Evidence Systematic Review concluded that there is a moderate level evidence for a reduced risk of age-related cognitive decline, mild cognitive impairment, dementia, and/or Alzheimer's disease as a result of dietary patterns with higher intakes of vegetables, fruits, legumes, beans, nuts, fish, seafood, and unsaturated vegetable oils/fats, and lower intakes of red/processed meats, sugar-sweetened beverages, and ultra-processed foods.

Specific diets such as the Mediterranean, DASH (Dietary Approaches to Stop Hypertension), and MIND (Mediterranean-DASH Diet Intervention for Neurodegenerative Delay) diets have been investigated widely in relation to cognition, cognitive decline, dementia risk, brain imaging biomarkers, brain volume and Alzheimer's disease pathology. Each of these diets share a broader dietary pattern that emphasizes the promotion of foods and nutrients discussed above. Based on longitudinal studies among older adults, the MIND and Mediterranean diets have the most compelling evidence. These plant-based dietary patterns may lower systemic inflammatory biomarkers, and neuroinflammation, and help with vascular health. The MIND diet was recently tested in the U.S. POINTER clinical trial as a component of two multidomain lifestyle interventions that also aimed to enhance physical activity, cognitive and social challenge, and health monitoring. The two interventions differed in structure, intensity, and accountability. Both interventions resulted in clinically significant improvements in cognitive test scores, with greater improvements among participants receiving the more intensive intervention.

IMPLICATIONS FOR PUBLIC HEALTH

The findings outlined above suggest that transitioning to a diet rich in fruits and vegetables with lean proteins and healthy fats may benefit cognitive health for all adults. Public health recommendations should encourage individuals, especially those at risk for cognitive decline, to adopt dietary patterns that prioritize plant-based foods, lean proteins, and healthy fats, while limiting intake of unhealthy fats and sugars. Such dietary changes should be tailored to individual needs and cultural contexts, ensuring they are realistic, affordable, accessible, manageable, and sustainable.

The role of social determinants of health

Dietary habits are influenced by cultural, social, and economic factors, including food access and affordability. Availability of healthy foods is positively associated with better memory, whereas limited access to healthy foods is associated with cognitive decline, food insecurity, and higher likelihood of depressive symptoms. Public health initiatives, such as community-based programs and policies improving food availability, are crucial in reducing these disparities. Programs like the Supplemental Nutrition Assistance Program (SNAP) have been linked to slower memory decline, reinforcing the need to ensure equitable access to nutritious foods, particularly for underserved communities. Public health initiatives should address disparities in access to healthy food and promote healthier food environments.



DISCUSSION

Current research underscores the importance of nutrition in cognitive health, particularly the protective effects of primarily plant-based diets. These diets, with their emphasis on whole, nutrient-dense foods, have been shown to slow cognitive decline, improve brain function, support brain volume, and reduce the risk of dementia. Nutritional research faces ongoing challenges in measuring dietary intake, standardizing diet scoring methods, determining the optimal timing for dietary interventions, understanding the effects of supplements compared with whole foods, and accounting for an individual's culture and dietary preferences. Studies are also needed to assess the effects of dietary interventions on cognition based on when in life (adolescence, mid-life, older age) dietary patterns are changed.

DIET, NUTRITION AND COGNITION

In conclusion, dietary interventions, especially when integrated with other lifestyle modifications such as physical activity, cognitive training, social interaction, and cardiovascular risk management, can be an effective strategy for improving cognitive health. As with all interventions, they must be adaptable, culturally relevant, and sustainable in the long term. Addressing dietary access and equity is crucial to ensure that these benefits reach all populations.

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Glossary

Diet refers to the types and amounts of food and beverages consumed by an individual.

Dietary patterns refers to the combination and quantities of foods and beverages consumed over time.

Nutrition refers to the process of using food for growth, metabolism and tissue repair.

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