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DEMENTIA RISK REDUCTION

Diet, Nutrition, and Cognition:

Seeing Food as Medicine

What Is Already Known

For overall health and well-being, the American Heart Association and the U.S. government's Dietary Guidelines for Americans recommend a diet that emphasizes plant-based foods, such as fruits, vegetables, whole grains, nuts, and seeds, as well as low-fat dairy, fish, and lean meats. Red meats, sodium, saturated fats, sugars, and highly processed foods should be limited or avoided. This pattern of eating is similar to the recommendations of both the "Mediterranean-style" and "Scandinavian-style (Nordic)" diets (although specific aspects differ) and is also associated with cognitive health. The World Health Organization (WHO) recently recommended a Mediterranean-style diet for all adults with normal cognition or mild cognitive impairment as one factor that may reduce the risk of cognitive decline or dementia.

Background and Evidence Base

Diet may have direct and/or indirect effects on cognitive health. Nutrients like vitamins, fiber, antioxidants, salt, fat, and fiber could directly affect cognitive health through effects on antioxidation, anti-inflammation, and endothelial and mitochondrial function. These nutrients may also indirectly affect cognitive health through cardiovascular-related effects from diabetes, dyslipidemia, hypertension, obesity, and/or homocysteine levels.

However, the effects of diet on overall health can be difficult to study. A person's diet consists of the individual foods eaten in a given day, along with the individual nutrients in each food and the interactions of these components. But, diet also comprises current dietary patterns against the background of one's dietary pattern history, sociocultural identity, and demographic characteristics. Thus, it is difficult to isolate a specific component of diet that is associated with a specific outcome. Because of methodological issues, randomized controlled trials with dietary interventions are difficult to perform. Accordingly, while there have been some randomized controlled trials, most studies on the relationship between nutrition and cognition have been observational.

Research related to nutrition and cognition generally includes studies of single nutrients, studies of food and beverage groups, and studies of overall dietary patterns.

A recent meta-analysis examined evidence from 15 randomized controlled trials that assessed the effect of interventions with a major dietary component on cognitive function or incident dementia in cognitively normal adults. The results showed that intervention with a major dietary component improved cognitive function.

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

Another recent review summarized research studies that explored the effects of diet on cognition. The review included an examination of studies on the effects of specific nutrients, such as vitamins and minerals, on cognitive health. It concluded that most studies showed no effect, although some reported protective effects of certain vitamins, antioxidants, and macronutrients (e.g., vitamins from the B group, vitamin E, and fatty acids). It is important to note, however, that current guidelines recommend getting nutrients from whole food sources, *not* from dietary supplements. The WHO guidelines strongly recommend *against* the use of supplementation as a means of reducing risk of cognitive decline because there is no evidence of benefit. However, multivitamins may be more promising than individual vitamin supplements. The review also noted positive associations between cognitive health and consumption of specific groups of foods and beverages, such as red wine (in moderate amounts), coffee, tea, fish/seafood, some fruits, and vegetables.

Evidence for an association between eating patterns and cognition

Findings from many studies support the recommendation of a balanced pattern of eating, such as a Mediterranean-style diet, for cognitive and overall health. Although a recent review reported some positive effects of individual nutrients or food groups on cognitive health, it concluded that an association between nutrition and cognitive outcomes was stronger for balanced dietary patterns than for individual nutrients and food groups, possibly because of the cumulative beneficial effects of the ingredients in these diets. The authors of the review highlighted the positive effects of a Mediterranean-style diet on cognitive health and also noted benefits associated with the Dietary Approaches to Stop Hypertension

(DASH) and Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diets.

Evidence for an effect of multi-domain interventions on cognitive health

The Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER) investigated whether multi-domain interventions that targeted several risk factors and mechanisms simultaneously would have a significantly positive effect on cognitive health. The study included 1,260 older adults at risk of cognitive decline. The study's interventions included exercise, cognitive training, social activities, diet, and vascular risk monitoring compared with a control intervention of standard health advice. The trial emphasized using small but effective changes, setting personal goals, and group sessions that covered topics such as diet and the brain, cooking, and grocery shopping. The dietary intervention was a Scandinavian-style diet that recommended reducing meat consumption, eating fish 2 to 3 times per week, and eating at least 500 grams of local fruits and vegetables per day. Results from the FINGER trial showed that people's baseline diet, which represented their general diet over a period of many years, predicted change in cognition in both the intervention and control groups over time. Importantly, however, dietary changes made during the study were associated with cognitive changes, and dietary improvement was significantly associated with beneficial changes in executive function. These findings show that when dietary changes are made along with other risk reduction strategies —and when people receive ongoing support related to these changes — people can make dietary changes that significantly benefit their cognitive health.

Implications for Public Health

The study results noted above highlight the health benefits of a "generally healthy" or Mediterranean-style diet for all adults, so changing to a healthier or Mediterranean-style diet should be recommended to anyone whose diet consists largely of items that should be avoided. However, while it is clear that food plays an integral role in a person's health, diet is just as integrally connected with a person's social and cultural experience. It is important to consider a person's existing diet and recommend manageable but important changes to bring the diet closer to the guidelines and make it easier for a person to adhere to the changes. Additionally, as with other risk reduction strategies, many people may need ongoing support to help maintain dietary changes. Therefore, there is a need for culturally-sensitive, community-based programs that offer ongoing support to help people sustain healthy changes to their diets.

Discussion

Research to date shows that what people eat has a significant effect on their cognitive health and that a Mediterranean-style or Scandinavian-style diet may benefit cognitive health. Current guidelines recommend these diets for all adults in general and specifically for adults at risk for, or with, cognitive decline. However, research on diet and cognition can be challenging because of multiple methodological issues, such as how best to measure nutrient levels, how to control for a person's baseline diet, and how to determine exactly what a person has eaten. Additionally, there are still many areas for which current information is not sufficient to make strong conclusions, such as how long dietary interventions need to last in order to be effective, whether there is a certain stage of life in which dietary intervention is most important, and whether nutrition from supplements (in contrast to nutrition from whole foods) can benefit people with nutritional deficiencies.

Finally, dietary interventions should be sustainable both for the individual and for the environment. They should be adapted to be culturally relevant and culturally appropriate for diverse communities. And attention must be paid to addressing disparate access to appropriate foods.

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