
Adherence to a Mediterranean-style diet can slow the rate of cognitive decline and decrease the risk of dementia: a systematic review

Opie RS, Ralston RA, Walker KZ

CRD summary

The authors concluded that there was strong evidence that a Mediterranean-style diet could protect against cognitive decline and the development of Alzheimer's disease. This appears to be overly optimistic in view of the potential for publication bias, the limited evidence from studies with poor designs, and the often conflicting results from these studies.

Authors' objectives

To assess the association between a Mediterranean-style diet and cognitive performance, dementia, Alzheimer's disease and associated mortality, in an ageing population.

Searching

MEDLINE, EMBASE and CINAHL were searched for articles from September 1970 to January 2012; search terms were reported. Reference lists of retrieved papers were screened for additional relevant studies. Only studies published in English were sought; grey literature was not sought.

Study selection

Studies of people aged 60 years or older were included in the review if they assessed the effects of a Mediterranean-style diet on cognitive function, dementia, Alzheimer's disease or deaths related to Alzheimer's disease. Studies assessing single foods or nutrients, or not adjusting for potential confounders, were excluded.

The included studies were conducted in the USA, France or Greece and published between 2006 and 2011. Where stated, most studies included people who did not have dementia; some studies included patients with Alzheimer's disease or mild cognitive impairment. The most commonly reported outcomes were dementia, Alzheimer's disease and cognitive performance or decline, measured using a range of cognitive tests, including the Mini-Mental State Examination, Isaacs Set Test, the Clinical Dementia Rating, and the Diagnostic and Statistical Manual of Mental Disorders third or fourth edition. Most studies assessed adherence to the diet using the Mediterranean Diet (MeDi) score.

Two reviewers assessed studies for inclusion.

Assessment of study quality

Study quality was assessed using the criteria recommended by the Academy of Nutrition and Dietetics (formerly the American Dietetic Association). Studies were rated positive or neutral.

One reviewer assessed quality, with areas of uncertainty resolved through discussion with the two other reviewers.

Data extraction

One reviewer extracted the data on magnetic resonance imaging (MRI) infarcts, white-matter hyper-intensities, cognitive performance, presence of mild cognitive impairment, dementia, Alzheimer's disease and deaths related to Alzheimer's disease. Uncertainties were resolved through discussion with the two other reviewers.

Methods of synthesis

A narrative synthesis was presented.

Results of the review

Eleven studies were included in the review; 10 were prospective cohort studies and one was a cross-sectional study (23,649 participants; range 192 to 8,085). The included studies were based on five cohorts. The median follow-up ranged from 2.2 to 8.0 years. Ten studies were rated positive for quality and one was rated neutral. The limitations

were selection bias, missing baseline data, lack of power, short follow-up, lack of generalisability, and issues with statistical analyses.

Cognitive performance: Four studies reported cognitive performance. Adherence to a Mediterranean-style diet was not consistently associated with cognitive performance in two studies. The other two studies suggested that higher adherence slowed cognitive decline.

Mild cognitive impairment and progression to Alzheimer's disease: Mild cognitive impairment was assessed in two studies, with conflicting results; one found no association, and the other found that each additional unit of the MeDi score was associated with an 8% lower risk of developing mild cognitive impairment for patients who were cognitively normal at the start. For patients with mild cognitive impairment at the start, a higher MeDi score was associated with a lower risk of developing Alzheimer's disease.

Dementia and Alzheimer's disease: Four of the six studies that assessed the relationship between adherence to a Mediterranean-style diet and dementia, Alzheimer's disease or both, reported a significant risk reduction. The other two studies reported no association.

Deaths related to Alzheimer's disease: These were assessed in one study, which found a 21% to 24% lower risk of death with each additional unit of the MeDi score. After adjustment for cardiovascular risk factors, this association was weaker, but remained statistically significant.

MRI infarcts and white-matter hyper-intensities: The Mediterranean-style diet was associated with a 9% to 11% lower risk of MRI infarct, but no association was found between the diet and white-matter hyper-intensities (one study).

Authors' conclusions

There was strong evidence that a Mediterranean-style diet protected against cognitive decline and the development of Alzheimer's disease.

CRD commentary

The review question was clear, but the inclusion criteria were broad. Only studies published in English were sought, so some relevant studies may have been missed. Study selection was duplicated, reducing the potential for reviewer error and bias, but only one reviewer extracted the data and assessed quality.

The quality of the included studies was assessed and the limitations of the studies were discussed. The authors acknowledged that the lack of high-quality studies, such as randomised controlled trials, was a limitation of the review, as was the inclusion of only five different cohorts, which reduced the generalisability of the results. The authors also acknowledged the limitations of the methods that were used to assess dietary habits; assessing diet at one time point was unlikely to reflect long-term habits, and the dietary records of people with cognitive problems or Alzheimer's disease could be inaccurate. A narrative synthesis was appropriate in view of the different outcomes and cognitive tests.

The authors' conclusion that there was strong evidence for the protective role of a Mediterranean-style diet appears overly optimistic, in view of the potential for publication bias, limited evidence identified, and often conflicting results from the included studies.

Implications of the review for practice and research

Practice: The authors stated that the Mediterranean-style diet should be promoted to older Australians. Support for dietitians in implementing this change could reduce the high health care costs of cognitive decline with age.

Research: The authors suggested investigation of the optimal timing for dietary intervention for an elderly population, and strict definition of the adherence to a Mediterranean diet that is required for a beneficial effect on cognition. They recommended identifying the key components associated with improved health outcomes, and determining the best methods of dietary education to support change.

Funding

Not stated.

Bibliographic details

Opie RS, Ralston RA, Walker KZ. Adherence to a Mediterranean-style diet can slow the rate of cognitive decline and decrease the risk of dementia: a systematic review. *Nutrition and Dietetics* 2013; 70(3): 206-217

DOI

10.1111/1747-0080.12016

Original Paper URL

<http://onlinelibrary.wiley.com/doi/10.1111/1747-0080.12016/abstract>

Indexing Status

Subject indexing assigned by CRD

MeSH

Diet, Mediterranean; Humans; Cognition Disorders; Dementia

AccessionNumber

12013061929

Date bibliographic record published

05/12/2013

Date abstract record published

18/11/2014

Record Status

This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.