



## Diet, nutrition and cognitive health in older adults: Shedding new light through systematic review and meta-analysis of intervention studies

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Globally the population is ageing, with predictions that by 2050 there will be 150 million people living with dementia<sup>(1)</sup>. Cognitive dysfunction and dementia are leading causes of disability and poor quality of life in older people<sup>(2)</sup>, therefore identifying the modifiable risk factors that may protect against these conditions has become a major public health priority<sup>(1)</sup>. In particular, there is much interest in the role of dietary factors in maintaining cognitive health as people age. Observational and intervention studies have linked certain dietary patterns and/or specific nutrients with a reduced risk of dementia<sup>(3)</sup>, however, the evidence is rather inconsistent. The aim of this systematic review with meta-analyses was to investigate the effect of diet and specific nutrients on cognitive function in older adults.

The bibliographic databases MEDLINE, EMBASE and PsycINFO were used to search the literature. The following inclusion criteria were applied to select studies: randomised controlled trial (RCT) or dietary intervention with a control group; duration of intervention of  $\geq 12$  months; adults aged  $\geq 50$  years. Two reviewers independently screened the papers based on the inclusion criteria and assessed the studies for bias using the Cochrane Risk of Bias 2 tool. For meta-analyses, mean differences (MD) and standardised mean differences (SMD) were calculated for global cognition and component cognitive domain scores including, executive function, processing speed and memory. The quality of evidence was assessed using the GRADE assessment framework (grading of recommendations, assessment, development, and evaluations) which rates the evidence of each outcome as high certainty, moderate certainty, low certainty, or very low certainty. A sensitivity analysis was conducted to determine the impact of studies found to be at a high-risk of bias.

Thirty-two studies fulfilled the inclusion criteria, of which 29 provided sufficient data for meta-analyses. Intervention with B-vitamins for at least one year was found to have significant effects on memory (SMD 0.09, 95% CI, 0.02 to 0.16; 13 studies; 7330 participants; moderate certainty); removing the B-vitamin studies ( $n = 2$ ) deemed to be at a high-risk of bias had no impact on the results. Vitamin D supplementation resulted in improved overall cognitive function scores (SMD 0.82, 95% CI, 0.08 to 1.55; 4 studies; 4593 participants; low certainty). The analysis showed no significant benefits for cognitive function in response to intervention with the Mediterranean diet or omega-3 supplements, however, far fewer studies were available to provide robust analysis of these outcomes.

These results indicate that B-vitamins and vitamin D may have specific benefits for the ageing brain. Interventions to improve the status of these nutrients may be beneficial in maintaining better cognitive health and preventing the onset of dementia in older people but further research, particularly in the form of RCTs, is required to confirm these findings.

### References

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