

Dietary Interventions and Neurocognition Across the Dementia Continuum: A Systematic Review, Meta-Analysis, and Meta-Regression of 92 Randomised Controlled Trials



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KEY MESSAGE: Dietary interventions provide modest benefits for global cognitive function (Hedges' g = 0.26). Multidomain and whole dietary pattern interventions are most promising, particularly in adults with mild cognitive impairment (MCI) and cardiometabolic comorbidity. Substantial heterogeneity and very low GRADE certainty of evidence highlight the urgent need for standardised protocols and cognitive outcome measures to advance the dementia prevention evidence base.

INTRODUCTION	METHODS	RESULTS	CONCLUSIONS	REFERENCES
BACKGROUND >55 million people worldwide live with dementia; projected to exceed 153 million by 2050 (<i>WHO, 2025; Nichols et al., 2022</i>) - Five of the 14 Lancet Commission 2024 modifiable risk factors are diet-related: obesity, T2DM, hypertension, elevated LDL cholesterol, and excessive alcohol intake (<i>Livingston et al., 2024</i>) - WHO and NICE emphasise multimodal behavioural strategies (<i>WHO, 2019; NICE, 2015</i>) EVIDENCE GAP - Prior reviews are fragmented; No synthesis has evaluated all RCT evidence across <i>all</i> dietary intervention types and the full dementia continuum AIM To evaluate the effects of dietary interventions on cognitive function across the full dementia continuum: healthy adults → preclinical → MCI → clinical dementia World map of primary studies	SEARCH STRATEGY 7 databases + 3 trial registries searched from inception to December 2025 Eligible: RCTs ≥2 weeks; adults 18+; any dementia stage; multidomain, total dietary pattern, or single-food interventions Exclusions: nutritional supplements, cross-over trials, <14-day protocols DATA EXTRACTION & ANALYSIS - Triple-coded extraction; Cochrane Risk of Bias 2 (RoB2) tool - Random-effects meta-analysis (Hedges' g); prespecified meta-regression; GRADE certainty of evidence - DSM-5 neurocognitive domain mapping applied to 190 cognitive outcome measures Global Cognitive Measures mapped to DSM-5 neurocognitive domains	STUDY CHARACTERISTICS 92 RCTs; 121 comparisons; 25,769 participants; 26 countries; 190 distinct cognitive measures; 1,044 total outcomes META-ANALYSIS	KEY CONCLUSIONS - Multidomain and total dietary pattern interventions show modest benefits - Single food interventions show inconsistent, non-significant effects and are not recommended - Effects greatest in MCI populations with cardiometabolic comorbidity - Confidence in the evidence is limited by heterogeneity and very low GRADE IMPLICATIONS FOR PRACTICE - Integrated lifestyle interventions (diet + exercise + cardiovascular monitoring + structured support) offer the most promising strategy - Dietary modification appears most beneficial in the preclinical/MCI phase, before irreversible neurodegeneration occurs IMPLICATIONS FOR RESEARCH - Prioritise adults with preclinical/MCI + cardiometabolic risk in future high-quality RCTs - International consensus needed on dietary protocol reporting and cognitive outcome standardisation (DSM-5 framework) - Individual participant data meta-analysis and network meta-analysis warranted	KEY REFERENCES - WHO. (2025). Dementia fact sheet. - Nichols et al. (2022). Lancet Public Health. DOI: 10.1016/S2468-2667(21)00249-8. - Livingston et al. (2024). Lancet. DOI: 10.1016/S0140-6736(24)01296-0 - WHO. (2019). Risk reduction of cognitive decline and dementia: WHO guidelines. ISBN: 9789241550543. - NICE. (2015). Dementia, disability and frailty in later life: mid-life approaches to delay or prevent onset. NICE guideline NG16. FUNDING NIHR Applied Research Collaboration Oxford & Thames Valley; NIHR Oxford Health Biomedical Research Centre CONTACT Dr Megan Kirk Chang, PhD Senior Researcher, Metabolic Psychiatry, Dept of Psychiatry, University of Oxford megan.kirkchang@psych.ox.ac.uk

Figure 1. Geographic distribution of 92 included RCTs

Figure 2. Global Cognitive Measures mapped to DSM-5 neurocognitive domains