

FC4: Maintain Your Brain: a scalable 3-year online intervention which reduced cognitive decline in 55-77 year olds

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Objective: There is increasing focus on effective preventative interventions applicable at the population scale such as through technology and web-based approaches. We aimed to reduce cognitive decline with ageing using an online package of interventions delivered intensively for 12 months followed by monthly boosters for 24 months.

Methods: Invitations were sent to people aged 55-77 years from the 45 and Up study, a population-based cohort study of one in ten people aged 45 years and older in New South Wales, Australia (n=267,000). Participants were required to be eligible for at least two of four modules addressing physical inactivity and associated health risks (Physical Activity), adherence to a Mediterranean-type diet and health risks associated with poor nutrition (Nutrition), cognitive activity (Brain Training) and mental well-being (Peace of Mind). Participants received modules based on their risks, with 1:1 randomized allocation to active personalised coaching modules (intervention) or static information-based modules (control). The primary outcome was change in an online combined multi-domain cognitive score measured using COGSTATE and Cambridge Brain Sciences tests using intention to treat analysis. Secondary outcomes included specific cognitive domain and ANU-ADRI risk scores.

Results: From 96,418 invitations, 14,064 (14%) consented; 11,026 (11%) were eligible; and 6,104 (6%) completed all 10 baseline assessments. Over three years there was a significantly greater improvement in the global composite cognition z-score in the intervention group, ES = 0.106 (p<0.001). Significant benefits were also found in complex attention, executive function and learning and memory (all p<0.001), as well as on a validated dementia risk instrument (p=0.007).

Conclusion: An online platform that tailored physical activity, nutrition, brain training, depression and anxiety interventions to an individual's risk factor profile over three years significantly delayed cognitive decline in older adults. This platform is scalable and if rolled out at a population level may help reduce the prevalence of dementia globally.