46th Annual Scientific Meeting of the Nutrition Society of Australia, 29 November – 2 December 2022, Sustainable nutrition for a healthy life

Associations between data-driven lifestyle profiles and cognitive function

S.E. Dingle[1], S.J. Bowe[2], M. Bujtor[1,3], C.M. Milte[1], R.M. Daly[1], K.J. Anstey[4,5], J.E. Shaw[6] and S.J. Torres[1]

[1]*School of Exercise and Nutrition Sciences, Faculty of Health, Deakin University, Geelong, Vic. 3220, Australia,*
[2]*Biostatistics Unit, Faculty of Health, Deakin University, Geelong, Vic. 3220, Australia,*
[3]*Stress, Psychiatry and Immunology Laboratory, Department of Psychological Medicine, Institute of Psychiatry, King's College, London, SE5 9RT, UK,*
[4]*University of New South Wales, Sydney, NSW, Australia,*
[5]*Neuroscience Research Australia, Sydney, NSW 2000, Australia and*
[6]*Baker Heart and Diabetes Institute, Melbourne, Vic 3004, Australia*

Modifiable risk factors play a key role in prevention of cognitive decline and dementia.[1,2] Furthermore, exploring the co-occurrence and clustering of these factors in relation to neurodegenerative risk is an important area of research.[3] Several simple additive scoring approaches have been explored; however, limited research has employed advanced data-driven approaches to explore this association. The aim of this study was to examine the association between data-driven lifestyle profiles and cognitive function in community-dwelling Australian adults. A cross-sectional analysis of $n = 4561$ Australian adults (55.3% female, mean age 60.9 ± 11.3 years) from the Australian Diabetes, Obesity and Lifestyle Study (AusDiab) was conducted. Questionnaires were used to collect self-reported data on diet, physical activity, sedentary time, smoking status, and alcohol consumption. Cognitive testing was undertaken at assess memory, processing speed, and vocabulary and verbal knowledge. Latent Profile Analysis (LPA) was employed to identify subgroups characterised by similar lifestyle-related behaviour patterns. Differences across the resultant profiles/subgroups and cognitive test scores were then explored using linear regression models and an automatic Bolck, Croon & Hagenaars (BCH) approach. Three profiles were identified: (1) "Inactive, poor diet" (76.3%); (2) "Moderate activity, non-smokers" (18.7%); and (3) "Highly active, unhealthy drinkers" (5.0%). Profile 2 "Moderate activity, non-smokers" exhibited better processing speed than Profile 1 "Inactive, poor diet" (0.023 v. -0.005, $p < 0.05$). There was also evidence to suggest Profile 3 "Highly active, unhealthy drinkers" exhibited poorer vocabulary and verbal knowledge compared to Profile 1 ($p = 0.029$) and poorer processing speed and memory scores compared to Profile 2 ($p = 0.018$ and $p = 0.024$, respectively). In conclusion, in this population of community-dwelling Australian adults, a sub-group characterised by moderate activity levels and higher rates of non-smoking had better cognitive function compared to two other identified sub-groups. This study demonstrates how LPA can be used to highlight sub-groups of a population that may be at increased risk of neurodegenerative decline and benefit most from lifestyle-based multi-domain intervention strategies.

References

1. World Health Organization (2019) *Risk reduction of cognitive decline and dementia*: WHO Guidelines. Geneva: WHO. Available from: https://www.who.int/publications/i/item/9789241550543
2. Livingston G, Huntley J, Sommerlad A, *et al.* (2020) *Lancet* **396**, 413–446.
3. Peters R, Booth A, Rockwood K, *et al.* (2019) *BMJ Open* **9**, e022846.