

## Habitual consumption of anthocyanin is associated with improvements in mood and cognitive performance in older people with memory complaints

E. Lorzadeh<sup>1</sup>, K. Kent<sup>2</sup>, V. Do Rosario<sup>1</sup>, S. Roodenrys<sup>3</sup>, K. Weston-Green<sup>2</sup> and K. Charlton<sup>1</sup>

<sup>1</sup>University of Wollongong, School of Science Indigenous and Health, Wollongong, New South Wales, 2522, Australia

<sup>2</sup>University of Wollongong, Faculty of Science- Medicine, and Health, Wollongong, New South Wales, 2522, Australia

<sup>3</sup>University of Wollongong, Faculty of Arts- Social Sciences and Humanities, Wollongong, 2522, New South Wales Australia

The role of flavonoids on cognitive performance in older adults has been intensively studied, with the subclass of anthocyanins showing promising outcomes<sup>(1)</sup>. However, there is conflicting evidence in the case of individuals at high risk of developing dementia, namely those with mild cognitive impairment (MCI). A recent study has suggested that cognitive scores in people with MCI were higher in those who had higher anthocyanin intake (>10 mg)<sup>(2)</sup>. Baseline data from 65 participants of an ongoing clinical trial that had an MIS (Memory Index Score) score  $\leq 13$  with self-reported subjective memory complaints, (mean age  $69.1y \pm 6.2$ ) were used to investigate the relationship between dietary anthocyanin intake and indices of mood and cognitive performance. Repeated 24-hour dietary intake was recorded through Intake24 (a computer-based program) for three days (2Xweekday and 1Xweekend day) and anthocyanin intake was quantified using the PhenolExplorer food composition database. The primary outcome of interest was the Buschke and Grober Free and Cued Selective Reminding Test-Immediate Recall (FCSRT+IR) (assesses auditory anterograde memory functioning), while other cognitive functions assessed included: Spot the Word-2 (assessing premorbid estimate); Oral Symbol Digit Test (speed of processing); List Sorting (working memory); Trail Making Test A & B (speed of processing/executive function); and Verbal Fluency (language/semantic memory). Subjective memory complaints were assessed using the Memory Assessment Clinic-Q (MAC-Q) and mood was assessed using the Geriatric Depression Scale (GDS). Independent t-tests were used to compare differences in cognitive tasks and mood scores between high (>10 mg/d) and low consumers of anthocyanins (<10 mg/d). There was a trend for high anthocyanin consumers ( $n = 35$ , median = 44.87 (10.01, 177.83)) to score better on FCSRT-Delayed Free Recall scores ( $16.57 \pm 3.74$ ) compared to lower consumers ( $n = 30$ , median = 0.01 (0, 9.51)), ( $15.97 \pm 0.18$ ) with a mean difference (SE) of  $-1.06$  (0.58) ( $p = 0.06$ ) suggesting recall of 1.06 more words after a 20-30 minute delay. Higher consumers had a lower GDS score ( $1.77 \pm 3.73$ ) compared to lower consumers ( $3.73 \pm 1.77$ ),  $p = 0.01$ . Spot the word test scores (assesses premorbid verbal abilities using a robust lexical decision task) were higher for high anthocyanin consumers ( $53.06 \pm 4.38$ ) compared to lower consumers ( $50.40 \pm 4.38$ ), mean difference (SE) =  $-2.66$  (1.10),  $p = 0.01$ , meaning participants with higher intake of dietary anthocyanin were able to point at 2.7 more real words than low consumers. Dietary consumption of anthocyanin in older adults with MIS is associated with beneficial effects on depressive scores and the ability to retrieve words. Further research is warranted to identify optimal dosage for recommended intake. This cross-sectional study used baseline data from a randomised controlled trial registered with the Australian New Zealand Clinical Trials Registry (ANZCTR):1262200065796.

**Keywords:** anthocyanin; cognitive performance; mood; dietary consumption

### Ethics Declaration

Yes

### Financial Support

This research received no external funding.

### References

1. Feng RC, Dong YH, Hong XL, Su Y & Wu XV (2023) *Nutrition Reviews* 1; **81**(3):287–303.
2. Kent K, Yousefi M, do Rosario VA, et al. (2022) *Nutrition Research* **104**, 36–43.