

## Chrono-nutrition behaviours and cognitive outcomes in 45–65-year-old adults living in Cyprus: the NUTRICO study

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Healthy cognitive function is of paramount importance in sustaining quality of life and reducing the risk of cognitive decline and dementia. 'Chrono-nutrition' encompasses the timing and distribution of food intake during the 24-hour period, meal frequency and regularity, duration of the eating period and the relative importance of these factors on metabolism and risk of chronic disease<sup>(1)</sup>. Evidence suggests that certain aspects of chrono-nutrition, such as time-restricted eating, are associated with better cognitive outcomes<sup>(2)</sup>. The aim of this study was to assess associations between chrono-nutrition components and cognitive outcomes in 45–65-year-old individuals living in Cyprus. Data were collected from 158 participants (55.7% female, median age: 53.0 years, 73.4% University graduates), via an online questionnaire assessing education, marital status, income, smoking, body mass index and chronic disease diagnosis. Sleep, physical activity and Mediterranean diet adherence were assessed using validated questionnaires. Chrono-nutrition was assessed using the Chrononutrition Profile - Questionnaire (CP-Q)<sup>(3)</sup> from which six chrono-nutrition behaviours were derived: breakfast skipping, largest meal of the day, evening eating (eating late in the waking day), evening latency (duration of time between one's last eating event and sleep onset, night eating (waking in the night to eat) and eating window (duration of time between the first and last eating event of the day). A weighted aggregate score of working and non-working days representing weekly patterns was calculated<sup>(3)</sup>. Composite memory, verbal memory, visual memory, psychomotor speed, reaction time, complex attention, cognitive flexibility, processing speed, executive function, simple attention, motor speed were assessed using ten normed neurocognitive tests provided through online computerized neurocognitive remote testing<sup>(4)</sup> and a neurocognitive index, a form of a global neurocognition score, was calculated.

Ordinal logistic regression adjusted for age, sex, education, occupation, marital status, smoking, sleep, physical activity and Mediterranean diet adherence, was used to assess associations between the six chrono-nutrition behaviours and the standard normalized age-matched scores of cognitive outcomes categorized as: very low (reference), low, below average, average and above average.

Following adjustments, statistically significant associations were found for evening eating with neurocognitive index (odds ratio (OR): 1.62 (95% confidence interval (CI): 1.06–2.50);  $p = 0.028$ ), composite memory (1.33 (1.00–1.78);  $p = 0.050$ ) and processing speed (1.36 (1.01–1.81);  $p = 0.041$ ), and for breakfast skipping with psychomotor speed (1.22 (0.06–1.40);  $p = 0.006$ ), suggesting that evening eating and breakfast skipping are associated with higher odds of having a higher cognitive rating.

These preliminary findings need to be further explored in a larger sample also investigating potential residual confounding such as participants' chronotype and working hours. Breakfast skipping might be associated with better cognitive outcomes through effects on blood glucose concentration<sup>(5)</sup>. The unexpected finding that evening eating is associated with lower odds of a higher cognitive rating needs to be further explored.

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### References

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