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Associations between preferred and misaligned eating behaviours with cognitive outcomes in 45-65-year-old adults living in Cyprus: the NUTRICO study

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Healthy midlife cognitive function (CF) reduces the risk of cognitive decline in older age. Evidence suggests that chrononutrition behaviours, such as time-restricted eating (TRE), positively affect CF possibly through a bioenergetic switch towards ketone use by the brain, DNA repair, and antiinflammatory action[1,2]. However, misalignment between preferred and actual food intake timing might disrupt the circadian rhythm, negatively affecting CF[3]. This study investigated associations between chrononutrition behaviours, including eating misalignment, and cognitive outcomes in adults aged 45-65 living in Cyprus.

The following behaviours were derived from the Chrononutrition Profile Questionnaire[4], as a weighted aggregate score of working and non-working days: breakfast skipping, largest meal of the day, morning latency (time between waking and first eating event), evening eating (last eating event in the waking day), evening latency (time between last eating event and sleep onset), night eating (waking in the night to eat) and eating window (time between the first and last eating event)[4].

Misalignments were calculated by subtracting reported aggregate behaviour from preferred. Computerized neurocognitive remote testing was used to derive standard normalized age-matched scores for composite memory, psychomotor speed, cognitive flexibility, complex attention, and global neurocognitive index[5]. Education, marital status, smoking, body mass index, chronic disease diagnosis, Greek-Orthodox fasting, sleep, physical activity, and Mediterranean diet adherence were also assessed, the latter three using validated questionnaires.

Cognitive outcome scores were divided into tertiles and analyzed using ordinal logistic regression. Each chrononutrition variable, divided into categories[6,7], was independently regressed against each cognitive outcome, with the significant pairs then examined in multivariable models, adjusting for sociodemographic variables that were independently significantly associated with each cognitive outcome.

Two-hundred-seven participants were analyzed (58% female, median age: 52 yrs, 75.6% University graduates). Morning latency misalignment was associated with higher neurocognitive index (Odds Ratio (OR) of eating later than preferred by 30-90min: 2.28; 95% confidence interval (CI): 1.10-4.71 & OR of eating later than preferred by > 90min: 1.95; 95% CI: 1.03-3.68) and with higher cognitive flexibility score (OR of eating later than preferred by 30-90 min: 2.21; 95% CI: 1.07-4.60). An eating window longer than preferred by >120 mins was associated with a lower psychomotor speed score (OR: 0.16; 95% CI: 0.04−0.06). Evening eating between 20:00-22:59 *vs.* before 20:00 was associated with a higher complex attention score (OR: 2.04; 95% CI: 1.06-3.93).

The study findings on delaying the first eating episode and having a shorter eating window support previous findings that TRE is associated with better CF[2,3]. The association of evening eating with better CF might be related to unexplored aspects of the overall diet quality and the evening meal or other residual confounders and needs further exploration.

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