

In Italian Adults Dietary (Poly)phenol Intake, Inflammatory Biomarkers, and Mild Cognitive Impairment

A recent study examined the relationship between habitual dietary (poly)phenol consumption, cognitive status, and circulating inflammatory [biomarkers](#) in older Italian adults.



Study

The current cross-sectional study enrolled autonomous patients aged 65 years or older from the Geriatrics Unit at the IRCCS Oasi Research Institute in Troina, Italy. Eligible participants presented with subjective memory impairment and received a diagnosis of subjective cognitive decline, isolated [memory impairment](#), MCI, or mild vascular cognitive impairment. Individuals were excluded if they had dementia, other major neurological conditions, major psychiatric disorders, or a history of isolation. Of approximately 1,000 referrals, 92 participants met the eligibility criteria and provided informed consent.

Demographic, lifestyle, and clinical information were collected for all participants. The fully adjusted regression model examining MCI included energy intake, age, sex, [educational level](#), and smoking status. Dietary intake was assessed using a validated 110-item food frequency questionnaire (FFQ) to capture long-term eating patterns.

Dietary (poly)phenol intake was estimated by linking the FFQ with the Phenol-Explorer database, focusing on 75 relevant food items. Concentration values were based primarily on reverse-phase high-performance liquid chromatography data, with retention factors used to account for cooking and [food processing](#). Total daily intake was calculated by summing all classes.

Cognitive performance was evaluated using the Mini-Mental State Examination (MMSE) and the Montreal Cognitive Assessment (MoCA). Mood was assessed with both the Hamilton Depression Rating Scale (HDRS) for clinician-based evaluation and the [Geriatric Depression Scale](#), Short Form (GDS-SF) for self-reported symptoms. Daytime sleepiness was measured using the 8-item Epworth Sleepiness Scale (ESS), where higher scores reflect greater sleepiness. Plasma TGF- β 1 and TNF- α concentrations were measured using enzyme-linked immunosorbent assays.

Findings

A total of 92 older adults with memory complaints participated in the study and were grouped into quartiles of [dietary \(poly\)phenol intake](#). Demographic and lifestyle factors, including sex, education, and smoking status, were comparable across quartiles, whereas age differed between groups, with participants in the highest intake quartile being younger on average.

Clinical measures, particularly MMSE, MoCA, GDS, HDRS, and ESS scores, did not differ significantly across total (poly) phenol intake quartiles. However, participants without MCI reported significantly higher estimated intakes of total dietary (poly)phenols than those with MCI. Reported intakes of [flavonoids](#), anthocyanins, flavanones, flavones, hydroxycinnamic acids, and lignans were higher in the non-MCI group, whereas other (poly)phenol classes showed no significant differences.

At the individual compound level, participants without MCI reported higher estimated intakes of hesperetin, naringenin, [quercetin](#), lariciresinol, secoisolariciresinol, matairesinol, and pinoresinol. Other compounds did not differ significantly between groups.

Intake of certain (poly)phenols, such as anthocyanins, flavonols, flavanones, and hesperetin, showed modest but significant correlations with MMSE scores, suggesting a potential link to [cognitive performance](#). MoCA scores also correlated positively with the intake of several (poly)phenols, including flavanones, flavones, lignans, and specific individual compounds.

Some associations between (poly)phenols and mood or sleep scores were observed, but they were generally weak; total (poly)phenol intake was not significantly correlated with MMSE, MoCA, mood, or [sleep scores](#).

In MCI patients, a higher TGF- β 1/TNF- α ratio was correlated with lower MMSE and MoCA scores, suggesting this biomarker may reflect peripheral inflammation linked to poorer cognitive function. Because the study was cross-sectional, the direction of this relationship cannot be determined. No significant associations were found between total (poly)phenol intake and inflammatory biomarkers. Only certain (poly)phenols, such as flavanols, biochanin A, and caffeic acid, showed weak and limited correlations with specific [inflammatory markers](#).

Individuals with the highest intake of total (poly)phenols, flavonoids, and lignans had a lower likelihood of having MCI than those with the lowest intake, even after adjusting for [energy intake](#), age, sex, education, and smoking status. Among flavonoids, flavones showed the strongest inverse association with MCI. Higher intake of specific individual (poly)phenols, such as naringenin and several lignans (lariciresinol, matairesinol, and pinoresinol), was also associated with lower odds of MCI.

Conclusion

Higher dietary (poly)phenol intake was associated with a lower likelihood of MCI, while several specific subclasses and individual compounds were linked to better cognitive performance. Total (poly)phenol intake itself was not significantly correlated with MMSE or MoCA scores. While some modest associations between (poly)phenol intake and inflammatory biomarkers were observed, these relationships were generally weak; the findings did not establish an [anti-inflammatory mechanism](#).

The authors cautioned that the small, cross-sectional study cannot determine whether higher intake precedes or influences cognitive status. Reverse causation, dietary recall error, residual

confounding, single-time-point inflammatory [biomarker measurements](#), wide confidence intervals, and the lack of correction for multiple comparisons could have influenced the results, so the associations should be treated as exploratory.

Future research should aim to clarify the pathways through which (poly)phenols may be associated with cognitive health, including potential roles in [neuroprotection](#), vascular health, and gut-brain interactions. Longitudinal and interventional studies are needed to confirm these associations and to test whether changes in (poly)phenol intake affect cognitive outcomes. Understanding these mechanisms could inform dietary guidelines and the development of targeted nutritional interventions to support healthy cognitive aging.

Source:

<https://www.news-medical.net/news/20260920/Older-adults-with-higher-polyphenol-intake-were-less-likely-to-have-mild-cognitive-impairment.aspx>