function, physical function and mental health, living free of chronic diseases and reaching the age of 70 years (Extended Data Table 7).

Discussion

In two large prospective cohorts of US women and men, we found that higher adherence to dietary patterns, namely the AHEI, aMED, DASH, MIND, hPDI, PHDI, rEDIP and rEDIH, during mid-life was associated with greater odds of healthy aging after a 30-year follow-up. Among dietary patterns, AHEI was the most strongly associated with healthy aging and hPDI was the least associated. Compared to participants in the lowest quintile, those who were in the highest AHEI quintile (energy-adjusted mean score = 68.6 ± 4.6) had 86% greater odds of achieving healthy aging using an age cutoff of 70 years and 2.24 times greater odds using an age cutoff of 75 years. The AHEI was closely followed by the rEDIH, aMED, DASH, PHDI, MIND, rEDIP and lastly the hPDI. Associations were independent of other lifestyle factors, including physical activity level, smoking and BMI. The AHEI was also the most strongly associated with maintaining intact physical function and mental health among individual healthy aging domains. The PHDI was most strongly associated with maintaining intact cognitive health and surviving to the age of 70 years. The rEDIH was the most strongly associated with being free of chronic diseases. A higher intake of UPFs was inversely correlated with higher diet quality scores and was also associated with lower odds of healthy aging. Our findings provide evidence to support that adherence to healthy dietary patterns represents a potential strategy for healthy aging, patterns that particularly are richer in fruits, vegetables, whole grains, unsaturated fats, nuts and legumes, that include some dairy products, and that are lower in trans fats, sodium, and red and processed meats.

While all dietary patterns share similarities such as promoting an intake of fruits, vegetables and whole grains, while reducing the amount of red and processed meats, each pattern emphasizes specific components. For instance, while the aMED diet focuses on the Mediterranean staples of olive oil, fish and nuts[21], MIND further highlights the cognitive benefits of berries[22]. The DASH diet prioritizes sodium restriction for blood pressure control[23], the PHDI emphasizes healthy low greenhouse gas emission foods, such as plant-sourced protein food[24], and the hPDI uniquely attributes positive scoring to healthy plant-based foods and negative scoring to animal-derived foods[25]. In a previous report, adherence to the AHEI and aMED, assessed in 1984–1986, was associated with 34% (95% CI = 9–66%) and 46% (95% CI = 17, 83) greater odds of healthy aging, respectively, in the NHS (n = 10,670; 15-year follow-up)[19]. This analysis examined two dietary patterns with healthy aging in 2000 using the same definition as in the current study, but the Telephone Interview for Cognitive Status was used to assess the cognitive health domain. Our analysis, which included both the NHS and HPFS, involved long-term dietary assessment of eight dietary patterns over a period of 14 years, with an assessment of

healthy aging conducted 30 years after baseline. The results showed consistent and stronger associations for these two scores (84% greater odds for AHEI and 62% for aMED). The association between dietary
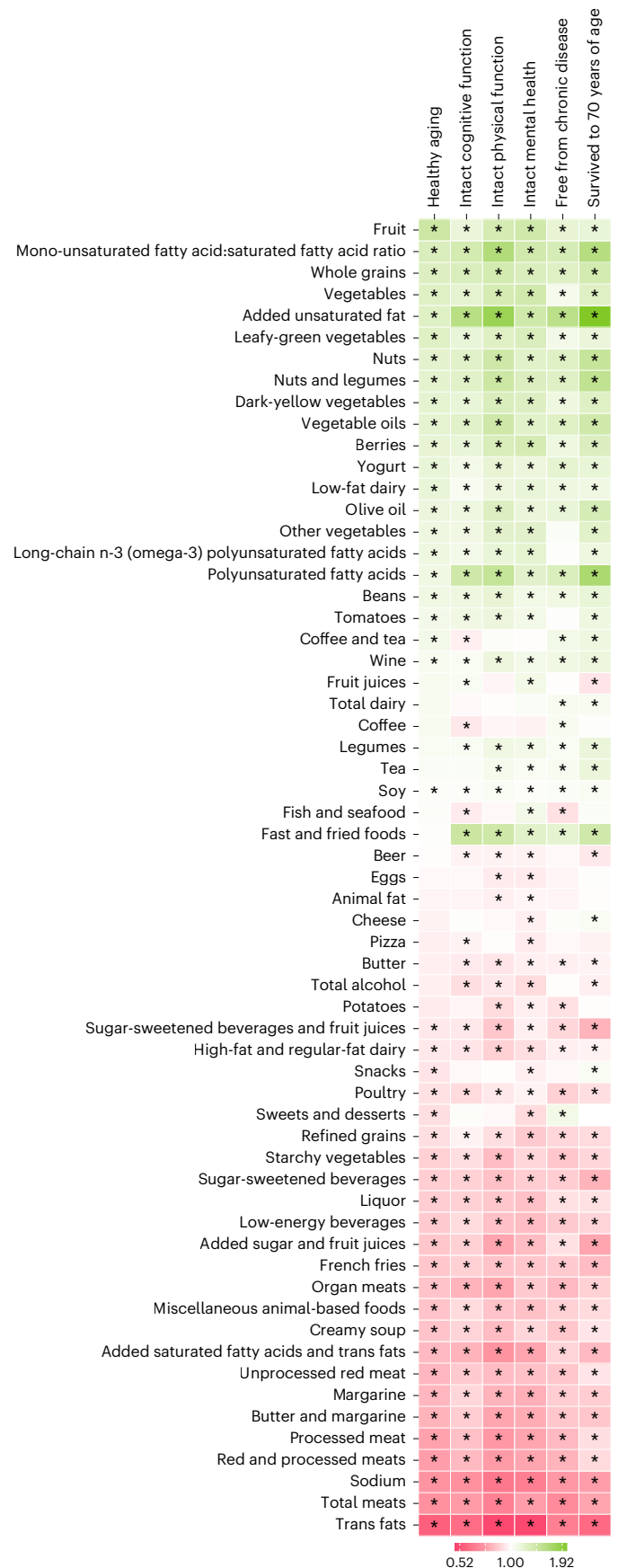

Fig. 4 | Multivariable-adjusted associations between dietary factors and healthy aging and its domains in the main pooled dataset (n = 105,015). Each heatmap square represent the OR comparing the 90th to the 10th percentile for each of the dietary factors. Logistic regressions were used to estimate ORs and were adjusted for age at baseline (1986), cohort (sex), BMI (kg m^{-2}), ancestry (European, Asian, African-American, Other), smoking status (never, former, current smoker: 1–14 cigarettes per day, 15–24 cigarettes per day and ≥25 cigarettes per day), alcohol intake (g per day), physical activity (MET-h week^{-1}), multivitamin use ever (yes/no), family history of myocardial infarction (yes/no), family history of type 2 diabetes, family history of cancer, family history of dementia (yes/no), postmenopausal status (yes/no) and menopausal hormone use (no, past, or current hormone use; women only), SES at baseline, marital status (yes/no), living alone ever (yes/no) and history of depression (yes/no) in the pooled cohorts. ORs greater than 1.0 are denoted in green; ORs below 1.0 are denoted in pink; a darker color indicates a stronger association. *Two-sided P values corrected for multiple comparisons using a false discovery rate (FDR) < 0.05.