

Table S1. Operationalization of the Lifestyle for Brain Health (LIBRA) score and factor weights in the Leipzig Research Centre for Civilization Diseases Adult Study (LIFE).

| Factor | Assessment | Operationalization and cutoffs | N (missings) | Weight |
|----------------------|---|---|---------------------|---------------|
| Heart disease | Self-reported medical history | Any of: myocardial infarction, angina pectoris, arrhythmia, cardiac insufficiency | 9786 (214) | +1.0 |
| Diabetes mellitus | Oral glucose tolerance test (oGTT) was conducted in all fasted participants who came to the study centre before 8 a.m. After initial blood drawing and an intake of 75 g of glucose solution (Accu-Chek® Dextrose O.G.T. Saft, Roche Diagnostics Deutschland GmbH), blood samples were taken for measurement of glucose and insulin concentration at 30 (glucose only) and 120 min; self-reported medical history | According to established cutoffs of the World Health Organization (WHO) guidelines ¹ : hemoglobin A1c (HbA1c) \geq 6.5% (\geq 48 mmol/mol); if HbA1c was not available: fasting glucose \geq 7.0 mmol/l; oral glucose tolerance test (oGTT; 120 min) \geq 11.0 mmol/l; self-reported diabetes | 10000 (0) | +1.3 |
| Hypercholesterolemia | Laboratory test performed on fresh biospecimen directly on the day of sample collection; including total cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL) cholesterol | According to the guidelines of the German Cardiac Society ² : raw value of total cholesterol of \geq 5.2 mmol/l and low-density lipoprotein (LDL) of \geq 4.2 mmol/l | 9772 (228) | +1.4 |
| Hypertension | Blood pressure was measured three times at 3-min intervals using an automatic oscillometric blood pressure monitor (OMRON 705IT, OMRON Medizintechnik Handelsgesellschaft mbH) after resting for at least 5 min at the study center; self-reported medical history | According to WHO guidelines ³ : mean systolic blood pressure \geq 140 mm Hg; or, if not available, diastolic blood pressure \geq 90 mm Hg, or self-reported hypertension | 9987 (13) | +1.6 |
| Depression | 20-item version of the Centre of Epidemiological Studies Depression Scale (CES-D) ⁴ ; self-reported medical history | CES-D score \geq 16 or, if not available, self-reported depression | 9431 (569) | +2.1 |
| Obesity | Body mass index (BMI) based on weight and height measurement. Body weight was measured with an electronic scale (SECA 701, Seca GmbH & Co KG) with a precision of 0.01 kg. Body height was assessed by means of a stadiometer (SECA 240) to the nearest 0.1 cm | Established cut-offs according to WHO guidelines ⁵ : BI) \geq 30; if BMI was not available: waist circumference for women > 88 cm, for men > 102 cm | 9980 (20) | +1.6 |

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| | Waist circumferences; taken using an ergonomic circumference measuring tape (SECA 201) to the nearest 0.1 cm | | | |
| Smoking | Standardized self-report questionnaire on ever and current smoking. | Self-reported current smoker | 9590 (410) | +1.5 |
| Low-to-moderate alcohol consumption | Standardized self-report questionnaire on frequency and amount of different alcoholic beverages consumed within the last year | Estimate of consumed grams of alcohol per day; low-to-moderate drinking as any amount of up to 12g/day for women, 24g/day for men according to German guidelines ⁶ | 9756 (244) | -1.0 |
| Physical inactivity | Subjectively reported physical activity was assessed using the short form of the International Physical Activity Questionnaire (IPAQ-SF) ⁷ | Total metabolic equivalent of task (MET) according to IPAQ-SF; "low" [= physically inactive], i.e. less than moderate level nominally indicating meeting physical activity guidelines of 30 minutes of moderate intensity activity 5 days a week, 20 minutes of vigorous activity 3 days a week, or a combination | 8270 (1730) | +1.1 |
| High cognitive activity | Indices of occupational cognitive demands were based on data from the 2010 Standard Occupational Classification of the O*NET database (http://www.onetonline.org) ⁸ by the US Department of Labor/Employment and Training Administration (USDOL/ETA). O*NET contains standardized validated descriptors for a wide range of occupations, including associated level and importance of cognitive abilities. We first translated the main occupation of each LIFE-Adult Study participants into English, and then matched the corresponding O*NET code to the occupation. O*NET data on cognitive abilities comprised 7 descriptors (e.g., memorization, deductive reasoning, verbal abilities) with a rating of the degree of its importance (1 = not important, 5 = | High cognitive activity being assumed for those in the highest tertile | 7900 (2100) | -3.2 |

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| | extremely important) and the level of how much a descriptor is needed to perform an occupation (0 = not at all, 7 = very much). The average of descriptors for importance and level was calculated, and both factors were calculate to achieve a continuous variable of overall occupational cognitive demand. The score was then split into tertiles.Thanks | | | |
| Healthy diet | Regarding dietary patterns, participants were asked about the consumption frequency of 34 food groups and 13 types of beverages within the last 12 months | Self-report of intake of several portions of fruit and/or vegetable daily over the last 12 months as assessed using a food frequency questionnaire | 9779 (221) | -1.7 |
| Chronic kidney disease | Laboratory test performed on fresh biospecimen directly on the day of sample collection; serum creatinine blood test; self-reported medical history | Estimated glomerular filtration rate (eGFR) calculated using the cystatin C-based chronic kidney disease (CKD) epidemiology collaboration equation ⁹ , eGFR cutoff < 60 mL/min/1.73m ² ; or, if not available, self-report of kidney insufficiency, any other kidney disease, dialysis duty | 9401 (599) | +1.1 |

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