**Supplementary Table 1.** Components and scoring criteria of DI-GM in NHANES.

|  |  |  |
| --- | --- | --- |
| Components of DI-GM | Included Foods within the Component | Scoring criteria |
| Beneficial to gut microbiota | Avocados | For each component beneficial to gut microbiota, a score of 1 if consumption at or above the sex-specific median, else 0 The total score for beneficial components ranged from 0 to 10 |
| Broccoli |
| Chickpeas |
| Coffee |
| Cranberries |
| Fermented dairy (including yogurt, cheese, kefir, sour cream, buttermilk) |
| Fiber |
| Green tea |
| Soybean (including Soy milk, Tofu) |
| Whole grains (grains defined as whole grains, containing the entire grain kernel—the bran, germ, and endosperm) |
| Unfavorable to gut microbiota | High-fat diet (% energy) |  0 if consumption at or above 40% energy from fat, else 1For each remaining component unfavorable to gut microbiota, a score of 0 if consumption at or above the sex-specific median, else 1The total score for unfavorable components ranged from 0 to 4 |
| Processed meat (including frankfurters, sausages, corned beef, and luncheon meat that are made from beef, pork, or poultry) |
| Red meat (including beef, veal, pork, lamb, and game meat; excludes organ meat and cured meat) |
| Refined grains (refined grains that do not contain all of the components of the entire grain kernel) |

Abbreviations: DI-GM, dietary index for gut microbiota; NHANES, National Health and Nutrition Examination Survey.

**Supplementary Table 2.** Variables in the 49-Item Frailty Index and Their Respective Scorings Criteria in NHANES.

|  |  |  |
| --- | --- | --- |
| **Item** | **variable** | **Scoring** |
| **Cognition** | - | - |
| 1. experience confusion/memory problems | pfq056, pfq057 | yes=1; no=0 |
| **Dependence** | - | - |
| 2. managing money difficulty | pfq060a, pfq061a | no difficulty=0; |
| some difficulty=0.33; |
| much difficulty=0.66; |
| unable to do=1 |
| 3. walking for a quarter mile difficulty | pfq060b, pfq061b | the same to above |
| 4. walking up ten steps difficulty | pfq060c, pfq061c | the same to above |
| 5. stooping, crouching, kneeling difficulty | pfq060d, pfq061d | the same to above |
| 6. lifting or carrying difficulty | pfq060e, pfq061e | the same to above |
| 7. house chore difficulty | pfq060f, pfq061f | the same to above |
| 8. preparing meals difficulty | pfq060g, pfq061g | the same to above |
| 9. standingup from armless chair difficulty | pfq060i, pfq061i | the same to above |
| 10. getting in and out of bed difficulty | pfq060j,pfq061j | the same to above |
| 11. using fork, knife, drinking from cup difficulty | pfq060k, pfq061k | the same to above |
| 12. dressing yourself difficulty | pfq060l, pfq061l | the same to above |
| 13. standing for long periods difficulty | pfq060m, pfq061m | the same to above |
| 14. grasp/holding small objects difficulty | pfq060p, pfq061p | the same to above |
| 15. attending social event difficulty | pfq060r, pfq061r | the same to above |
| 16. leisure activity at home difficulty | pfq060s, pfq061s | the same to above |
| 17. push or pull large objects difficulty | pfq061t | the same to above |
| **Depressive Symptoms** | - | - |
| 18. have little interest in doing things | dpq010 | **2007~** |
| nearly every day = 1 |
| more than half the days = 0.66 |
| several days = 0.33 |
|  |
| 19. feeling down, depressed, or hopeless | dpq020, ciqd001, ciqd002 | the same to above |
| 20. trouble sleeping or sleeping too much | dpq030 | **2007~** |
| nearly every day = 1 |
| more than half the days = 0.66 |
| several days = 0.33 |
| 21. feeling tired or having little energy | dpq040 | nearly every day = 1 |
| more than half the days = 0.66 |
| several days = 0.33 |
| 22. poor appetite or overeating | dpq050 | **2007~** |
| yes = 1 |
| no = 0 |
| 23. feeling bad about yourself | dpq060, ciqd029 | the same to above |
| 24. trouble concentrating on things | dpq070, ciqd043 | the same to above |
| **Comorbidities** | - | - |
| 25. doctor ever said you had arthritis | mcq160a | yes = 1; no = 0 |
| 26. ever told you had thyroid problem | mcq160i, mcd160m, mcq160m | the same to above |
| 27. ever told you had chronic bronchitis | mcq160k, mcq160p | the same to above |
| 28. ever told you had cancer or malignancy | mcq220 | the same to above |
| 29. ever told had congestive heart failure | mcq160b | the same to above |
| 30. ever told you had coronary heart disease | mcq160c | the same to above |
| 31. ever told you had angina/angina pectoris | mcq160d | the same to above |
| 32. ever told you had heart attack | mcq160e | the same to above |
| 33. ever told you had a stroke | mcq160f | the same to above |
| 34. ever told you had high blood pressure | bpq020 | the same to above |
| 35. doctor told you have diabetes | diq010 | yes = 1; no =0; borderline=0.5 |
| 36. ever told you had weak/failing kidneys | kiq020, kiq022 | yes = 1; no =0 |
| 37. urine leakage bother you? | kiq050 | **2007~** |
| greatly = 1 |
| very much = 0.75 |
| somewhat = 0.5 |
| only a little = 0.25 |
| **Hospital Utilization and Access to Care** | - | - |
| 38. general health condition | huq010 | excellent, very good, good = 0 |
| fair, poor = 1 |
| 39. health now compared with 1 year ago | huq020 | about the same, better = 0 |
| worse = 1 |
| 40. overnight hospital patient in last year | huq070, hud070, huq071 | yes = 1, no = 0 |
| 41. times receive healthcare over past year | huq050, huq051 | none = 0; 1-4 = 0.5; >=5 =1 |
| 42. number of prescription medicines taken | rxd030, rxduse, rxd295, rxdcount | no = 0; 1-4 = 0.5; >=5 =1 |
| **Physical Performance and Anthropometry** | - | - |
| 43. body mass index (kg/m^2) | bmxbmi | <18.5, ≥30 = 1 |
| 25–<30 = 0.5 |
| 18.5–25 = 0 |
| **Laboratory Values** | - | - |
| 44. glycohemoglobin(%) | lbxgh | 0%–5.7% = 0, >5.7% = 1 |
| 45. red blood cell count (million cells/ul) | lbxrbcsi | M: 4.7–6.1 = 0, Other = 1 |
| F: 4.2–5.4 = 0, Other = 1 |
| 46. hemoglobin (g/dl) | lbxhgb | M: 13.5–18 = 0, Other = 1 |
| F: 12–16 = 0, Other = 1 |
| 47. red cell distribution width (%) | lbxrdw | 11.6–14.6 = 0, Other = 1 |
| 48. lymphocyte percent (%) | lbxlypct | 20–40 = 0, Other = 1 |
| 49. segmented neutrophils percent (%) | lbxnepct | 40–80 = 0, Other = 1 |

**Supplementary Table 3.** Mediation Effects of relevant inflammatory parameters from complete blood count in the association between DI-GM and Frailty.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Mediator** | **Indirect effect** | **Direct effect** | **Total effect** | **Mediation proportions, % (95%CI)** |
| **Leukocyte** | -0.002 (-0.003, -0.02) \*\*\* | -0.026 (-0.033, -0.02) \*\*\* | -0.028 (-0.034, -0.022) \*\*\* | 5.7% (0.019, 0.106) \*\*\* |
| **Neutrophil** | -0.002 (-0.003, -0.021) \*\*\* | -0.027 (-0.033, -0.021) \*\*\* | -0.03 (-0.035, -0.023) \*\*\* | 7.9% (0.048, 0.117) \*\*\* |
| **Monocyte** | -0.001 (-0.002, -0.023) \*\*\* | -0.029 (-0.035, -0.023) \*\*\* | -0.03 (-0.036, -0.024) \*\*\* | 3% (0.012, 0.054) \*\*\* |
| **Lymphocyte** | 0 (0, -0.023) | -0.03 (-0.035, -0.023) \*\*\* | -0.03 (-0.035, -0.023) \*\*\* | / |
| **Platelet** | 0 (0, -0.023) | -0.03 (-0.036, -0.023) \*\*\* | -0.03 (-0.036, -0.023) \*\*\* | / |
| **NLR** | -0.001 (-0.002, -0.023) \*\*\* | -0.028 (-0.035, -0.023) \*\*\* | -0.03 (-0.036, -0.024) \*\*\* | 4.4% (0.021, 0.068) \*\*\* |
| **MLR** | 0 (-0.001, -0.024) \* | -0.029 (-0.035, -0.024) \*\*\* | -0.03 (-0.036, -0.024) \*\*\* | 1.6% (0.003, 0.031) \* |
| **PLR** | 0 (0, -0.023) | -0.03 (-0.036, -0.023) \*\*\* | -0.03 (-0.036, -0.023) \*\*\* | / |
| **SII** | -0.001 (-0.002, -0.023) \*\*\* | -0.029 (-0.035, -0.023) \*\*\* | -0.03 (-0.036, -0.024) \*\*\* | 2.9% (0.009, 0.055) \*\*\* |
| **SIRI** | -0.002 (-0.002, -0.022) \*\*\* | -0.028 (-0.034, -0.022) \*\*\* | -0.03 (-0.036, -0.024) \*\*\* | 5.5% (0.027, 0.088) \*\*\* |

Abbreviations: MLR, monocyte to lymphocyte ratio; NLR, neutrophil to lymphocyte ratio; PLR, neutrophil to lymphocyte ratio; SII, systemic immune inflammation index; SIRI, system inflammation response index; \* P < 0.05；\*\*\* P < 0.001