**Supplementary** **Material 1**. Cardiovascular health index and ideal group criteria included components.

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|  | **CANHEART health index** | **Life’s Simple 7 tools1** |
| (1) Smoking | Never or former smoker (>1 year) | Never or former smoker (>1 year) |
| (2) Physical Activity | At least 150 min/week moderate intensit-y or 75 min/week vigorous intensity | At least 150 min/week moderate intensit-y or 75 min/week vigorous intensity |
| (3) Dietary Intake | Fruit and vegetables consumed ≥ 5 times/day | At least 1 servings of fruits and vegetables/day and 2 servings of fish/week |
| (4) Body Mass Index | < 25 kg/m2 | < 25 kg/m2 |
| (5) Total Cholesterol2 | - | Untreated and <200 mg/dL   |
| (6) Blood Pressure | Self-reported hypertension diagnosed by a health care professional | Untreated and <80 mmHg   |
| (7) Plasma Glucose | Self-reported diabetes diagnosed by a health care professional | Untreated and <100 mg/dL |

1 Life’s Simple 7 tools, which emphasized by American Heart Association (2010) and modified by Samieri C (2018), were used in this study.

2 Total cholesterol component not included in CANHEART health index by Cardiovascular Health in Ambulatory Care Research Team (2013)

**Supplementary Material 2**. Association between Life’s Simple 7 score and cognitive function by gender (Men=830, Women=1,792)

|  |  |
| --- | --- |
| Life’s Simple 7 tools 1 | **Low cognitive function (MMSE-DS < 24)** |
| Age adjusted model | Model 1, additionally adjusted for SES and drinking status | Model 2, additionally adjusted for health status |
| OR2 | (95% CI) | OR2 | (95% CI) | OR2 | (95% CI) |
| **Total (N=2,622)** |  |  |  |  |  |  |  |  |  |
|  Poor (n=461) | 1.49 | (0.89 – 2.75) | 1.08 | (0.58 – 1.99) | 1.38 | (0.69 – 2.77) |
|  Intermediate (n=1,329) | 1.01 | (0.36 – 1.66) | 0.91 | (0.56 – 1.50) | 0.98 | (0.58 – 1.65) |
|  Ideal (n=832) | 1.00  | ref |  | 1.00  | ref |  | 1.00  | ref |  |
| **Total men (N=830)** |  |  |  |  |  |  |  |  |  |
|  Poor (n=231) | 1.27  | (0.27 - 5.97) | 1.27  | (0.30 - 5.30) | 1.71  | (0.37 - 7.93) |
|  Intermediate (n=425) | 1.04  | (0.24 - 4.45) | 1.00  | (0.26 - 3.87) | 1.43  | (0.35 - 5.79) |
|  Ideal (n=174) | 1.00  | ref | 1.00  | ref | 1.00  | ref |
| **Total women (N=1,792)** |  |  |  |  |  |  |  |  |  |
|  Poor (n=230) | 1.45  | (0.74 - 2.82) | 1.05  | (0.53 - 2.06) | 1.20  | (0.55 - 2.58) |
|  Intermediate (n=904) | 0.97  | (0.25 - 1.64) | 0.86  | (0.51 - 1.45) | 0.90  | (0.51 – 1.56) |
|  Ideal (n=658) | 1.00  | ref | 1.00  | ref | 1.00  | ref |

1 Life’s Simple 7 score emphasized by American Heart Association in 2010

2 Results from logistic regression model with penalized likelihood option; Model 1: Age adjusted model + house income, education level, marital status, and drinking status adjusted; Model 2: Model 1 + Total cholesterol, fasting glucose, and SBP adjusted

**Abbreviation**: MMSE-DS, Mini-Mental State Examination-Dementia Screening; SES: socio-economic status; OR, Odds Ratio; CI: Confidence interval; SBP, Systolic Blood Pressure; DBP; hs CRP: high-sensitivity C-reactive protein

**Supplementary Material 3**. Descriptive characteristics of participants included and excluded in sensitivity analyses.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variables | Participants included | 　 | Participants excluded | *P* value |
| in sensitivity analyses |  | in sensitivity analyses |
| (n=2,241) | 　 | (n=381) |
| Age, years, mean ± SD | 57.4  | ±3.9 |  | 56.5  | ±3.6 | <.001 |
| Gender, N(%) |  |  |  |  |  |  |
|  Men | 727 | (32.4) |  | 103  | (27.0) | 0.036 |
|  Women | 1,514 | (67.6) |  | 75  | (73.0) |  |
| Education attainment years, N(%) |  |  |  |  |  |  |
|  ≤6 years | 169  | (7.5) |  | 49  | (12.9) | <.001 |
|  6-9 years | 262 | (11.7) |  | 64  | (16.8) |  |
|  9-12 years | 953  | (42.5) |  | 165  | (43.3) |  |
|  12+ years | 857  | (38.3) |  | 103  | (27.0) |  |
| Family income(year), N(%) |  |  |  |  |  |  |
|  Q1 | 517  | (23.1) |  | 136  | (35.7) | <.001 |
|  Q2 | 670  | (29.9) |  | 102  | (26.8) |  |
|  Q3 | 421  | (18.8) |  | 89  | (23.4) |  |
|  Q4 | 633  | (28.3) |  | 54  | (14.2) |  |
| Marital status, N(%) |  |  |  |  |  |  |
|  Unmarried | 25  | (1.1) |  | 2  | (0.5) | 0.714 |
|  Married-death of spouse | 127  | (5.7) |  | 24  | (6.3) |  |
|  Married-separated | 124  | (5.5) |  | 22  | (5.8) |  |
|  Married-living together | 1,965  | (87.7) |  | 333  | (87.4) |  |
| Smoking, N(%) |  |  |  |  |  |  |
|  Non-smoker | 1,616  | (72.1) |  | 293  | (76.9) | 0.038 |
|  Former smoker | 429  | (19.1) |  | 52  | (13.7) |  |
|  Current smoker | 196  | (8.9) |  | 36  | (9.5) |  |
| Drinking, N(%) |  |  |  |  |  |  |
|  Non-drinker | 509  | (22.7) |  | 161  | (42.3) | <.001 |
|  Former drinker | 108  | (4.8) |  | 18  | (4.7) |  |
|  Current drinker | 1,624  | (72.5) |  | 202  | (53.0) |  |
| Regular physical activity, N(%)1 |  |  |  |  |  |  |
|  No | 573  | (25.6) |  | 132  | (34.7) | <.001 |
|  Yes | 1,668  | (74.4) |  | 249  | (65.4) |  |
| Body mass index, mean ± SD | 24.0  | ±2.9 |  | 23.9 | ±2.8 | 0.487 |
| Ever had hypertension, N(%)2 |  |  |  |  |  |  |
|  No | 1,718  | (76.7) |  | 300 | (78.7) | 0.373 |
|  Yes | 523  | (23.3) |  | 281 | (21.3) |  |
| SBP, mmHg, mean ± SD | 120.7  | ±15.3 |  | 118.0  | ±13.7 | <.001 |
| DBP, mmHg, mean ± SD | 76.8  | ±9.8 |  | 75.5  | ±8.6 | 0.008 |
| Ever had DM, N(%)2 |  |  |  |  |  |  |
|  No | 2,085  | (93.0) |  | 353  | (92.7) | 0.784 |
|  Yes | 156  | (7.0) |  | 28 | (7.4) |  |
| Fasting insulin, uIU/mL, mean ± SD | 8.9  | ±3.7 |  | 8.5  | ±3.6 | 0.03 |
| Fasting glucose, mg/dL, mean ± SD | 93.8  | ±19.5 |  | 94.3  | ±24.4 | 0.678 |
| HbA1c, %, mean ± SD | 5.8  | ±0.7 |  | 5.8  | ±0.8 | 0.762 |
| hs CRP, mg/L, mean ± SD | 1.4  | ±3.4 |  | 1.7  | ±4.7 | 0.323 |
| CANHEART health index, N(%)3 |  |  |  |  |  |  |
|  Poor | 282  | (12.6) |  | 60  | (15.8) | 0.238 |
|  Intermediate | 1,306  | (58.3) |  | 214  | (56.2) |  |
|  Ideal  | 653  | (29.1) | 　 | 107  | (28.1) |  |

1 Participants walking at least 30 minutes per day grouped into regular physical activity group

2 Self-reported disease history

3 CANHEART health index and its criteria emphasized by Cardiovascular Health in Ambulatory Care Research Team in 2014

**Abbreviation**: MMSE-DS, Mini-Mental State Examination-Dementia Screening; SD, Standard Deviation; SBP, Systolic Blood Pressure; DBP, Diastolic Blood Pressure; DM: Diabetes mellitus; HbA1c: hemoglobin A1c; hs CRP: high-sensitivity C-reactive protein

**Supplementary Material 4**. Association between CANHEART health index and cognitive function by gender and hs CRP tertile (Men=727, Women=1,514)

|  |  |
| --- | --- |
| CANHEART health index 1 | **Low cognitive function (MMSE-DS < 24)** |
| hs-CRP, lower tertile | hs-CRP, middle tertile | hs-CRP, higher tertile |
| OR2 | (95% CI) | OR2 | (95% CI) | OR2 | (95% CI) |
| **Total (N=2,241)** |  |  |  |  |  |  |  |  |  |
|  Poor (n=282) | 4.65 | (1.36 – 15.92) | 2.55 | (0.63 – 10.31) | 1.25 | (0.29 – 5.44) |
|  Intermediate (n=1,306) | 0.93 | (0.36 – 2.41) | 0.38 | (0.14 – 1.01) | 1.19 | (0.41 – 3.45) |
|  Ideal (n=653) | 1.00  | ref |  | 1.00  | ref |  | 1.00  | ref |  |
| **Total men (N=727)** |  |  |  |  |  |  |  |  |  |
|  Poor (n=163) | 6.74  | (0.84 - 54.36) | N/A  | N/A | 0.94  | (0.06 - 13.95) |
|  Intermediate (n=445) | 0.93  | (0.11 - 7.67) | N/A  | N/A | 0.48  | (0.03 – 6.81) |
|  Ideal (n=119) | 1.00  | ref | 1.00  | ref | 1.00  | ref |
| **Total women (N=1,514)** |  |  |  |  |  |  |  |  |  |
|  Poor (n=119) | 2.23  | (0.51 - 9.70) | 2.87  | (0.63 - 13.18) | 0.93  | (0.14 - 6.22) |
|  Intermediate (n=861) | 0.96  | (0.37 - 2.49) | 0.29  | (0.10 - 0.85) | 1.47 | (0.48 – 4.48) |
|  Ideal (n=534) | 1.00  | ref | 1.00  | ref | 1.00  | ref |

1 CANHEART health index and its criteria emphasized by Cardiovascular Health in Ambulatory Care Research Team in 2014

2 Results from logistic regression model with penalized likelihood option; Adjusted for age, house income, education level, marital status, drinking status, total cholesterol, fasting glucose, and SBP.

**Abbreviation**: MMSE-DS, Mini-Mental State Examination-Dementia Screening; OR, Odds Ratio; CI: Confidence interval; SBP, Systolic Blood Pressure; DBP; hs CRP: high-sensitivity C-reactive protein