Supplemental Material
Data S1. CRF allometric scaling models.

VO₂ peak was allometrically scaled using the procedure described by Vanderburgh et al.⁴⁹,¹⁰⁸ and seen in multiple CRF papers.⁴⁸,¹⁰⁹ Firstly, VO₂ peak and body weight were log-transformed. A log-linear regression model was constructed using log (VO₂ peak) as the dependent and log (body weight) as independent variables. The interaction effect of biological sex was tested and found to significantly modulate the association between body mass and VO₂ peak, justifying the need for biological sex specific exponent. For that reason, regressions were performed separately for men and women to ensure the models were appropriate. Homoscedasticity was assessed by plotting the standardized residuals against the standardized predicted value. The resulting beta coefficients were used as the allometric exponents. Thus, VO₂ peak can then be allometrically scaled using the following equation: ¹⁰⁹

\[
\text{allometrically scaled peak } \text{VO}_2 = \frac{\text{unscaled peak VO}_2}{\text{body mass}^{\text{exponent}}}
\]

In addition, Pearson correlation analysis was used to examine the association of the scaled VO₂ peak with non-scaled VO₂ peak to verify the effectiveness of the allometric scaling approach for controlling for body size within the sample.

There was a very strong correlation between VO₂ peak and allometric VO₂ \((r = .92, p < 0.001)\), suggesting that total body mass did not strongly affect our VO₂ peak measure and therefore, the results have remained practically stable.

CRF models has been replicated using the new VO₂ scaled value and the results are seen on Table S1, S2 and S3.
Data S2. Cardiovascular risk as measured by the Catalan-adjusted Framingham risk score (REGICOR).

To ensure our results were valid when adjusted for the Catalan population, we repeated our analyses with the REGICOR risk score\textsuperscript{53}. The REGICOR (Registre Gironí del Cor) function is an adaptation of the Framingham function to the incidence of ischemic heart disease and prevalence of local risk factors taking into account the different epidemiological characteristics of Spanish population. The Framingham-based REGICOR CV risk function provides a good prediction of the incidence of the coronary events of the general population of a region in the northwest of Spain and having a high long-term follow-up rate\textsuperscript{53}.

We found similar results both for the cognitive analyses and the cortical thickness analysis.
Data S3. Individual results for the cortical thickness analyses with the VO₂ peak groups and mediation analyses.

We run these models to illustrate the relationship between each significant cluster and VO₂ peak. Significant correlations were seen between VO₂ peak and left rostral middle frontal gyrus (r mean=0.118). The older middle age group (55 and above) showed that left rostral middle frontal gyrus (r mean= 0.172) and left superior temporal gyrus (r mean= 0.169) were positively associated to VO₂ peak.

The results also shown that cortical thickness significantly mediated the relationship between CRF 55 and above years old group and visuo-spatial problem solving, after controlling for age, biological sex, monthly incomes, education, waist perimeter and body mass index.
Data S4. Individual plots and table for the cortical thickness analyses with the cardiovascular risk (Framingham) score and mediation analyses.

We run these models to illustrate the relationship between each significant cluster and cardiovascular risk (Framingham score). Distributed clusters across multiple cortical regions were associated with cardiovascular risk (Framingham 5-year risk score). Those specific clusters were left post central (r mean= -0.170), left pars triangularis (r mean= -0.170), left insula (r mean= -0.170), left cuneus gyrus (r mean= -0.172), left lingual (r mean= -0.164), left caudal anterior cingulate gyrus (r mean= -0.184), left superior parietal gyrus (r mean= -0.158), left inferior parietal gyrus (r mean= -0.160), left transverse temporal gyrus (r mean= -0.169). left rostral middle frontal (r mean=-0.161) and left precentral gyrus (r mean= -0.170). On the right hemisphere, the correlations were in right inferior parietal gyrus (r mean= -0.176), para hippocampal region (r mean= -0.184), right cuneus (r mean= -0.192), right supramarginal gyrus (r mean= -0.175), right precentral gyrus (r mean= -0.165), right lateral occipital gyrus (r mean= -0.160), and right superior frontal gyrus (r mean= -0.163).

The results also shown that cortical thickness significantly mediated the relation between CVH and visuo-spatial problem solving, processing speed, flexibility, and memory, after controlling for education and monthly incomes.
Data S5. Self-reported physical activity and its association with cardiorespiratory fitness.

Self-reported physical activity was assessed using the International Physical Activity Questionnaire (IPAQ), validated for the Spanish/Catalan population. Data collected from the self-administered IPAQ surveys were summed within each physical activity domain (walking, moderate-intensity and vigorous-intensity activities) to estimate the total metabolic equivalent of task (MET) in minutes/week spent performing physical activity related to occupational, transportation, household, and leisure activities. The questionnaire was scored and analysed using established methods, available on the IPAQ website (www.ipaq.ki.se). Here, data collected with the IPAQ have been reported as a continuous measure. Total scores have been calculated for walking, moderate-intensity activities, and vigorous-intensity activities, for each domain (work, transport, domestic and garden, and leisure) and for overall total physical activity MET-minutes/week score, calculated as: Total physical activity MET-minutes/week = sum of Total (Walking + Moderate + Vigorous) MET-minutes/week scores.

Engagement in physical activity as measured by the total number of METs-min/week including ‘walking’, ‘moderate activity’ and ‘vigorous activity’ explained 46% of the variance in VO₂ peak in our cohort (β = 3.61, SE = 0.71, p = <.001, R²=0.46).
Table S1. Associations between CRF whole group allometric scaling values and cognitive domains.

| Domain                      | β     | SE   | P     | R²   |
|-----------------------------|-------|------|-------|------|
| Memory                      | -0.007| 0.003| 0.023 | 0.115|
| Working memory              | -0.002| 0.002| 0.387 | 0.006|
| Flexibility                 | -0.001| 0.002| 0.487 | 0.142|
| Processing speed            | -0.0006| 0.003| 0.839 | 0.163|
| Visuo-spatial problem solving | 0.005 | 0.002| 0.046 | 0.198|

All CRF allometric scaled models are controlling for age, education and socioeconomic status as a covariate. R² are adjusted for all predictors.

Table S2. Associations between CRF_40_55 group allometric scaling values and cognitive domains.

| Domain                      | β     | SE   | P     | R²   |
|-----------------------------|-------|------|-------|------|
| Memory                      | -0.007| 0.003| 0.025 | 0.115|
| Working memory              | -0.001| 0.003| 0.062 | -0.002|
| Flexibility                 | 0.0008| 0.002| 0.704 | 0.106|
| Processing speed            | -0.006| 0.003| 0.232 | 0.103|

Visuo-spatial problem solving | 0.001 | 0.003 | 0.731 | 0.083

All CRF allometric scaled models are controlling for age, education and socioeconomic status as a covariate. R² are adjusted for all predictors.

Table S3. Associations between CRF_55 and above group allometric scaling values and cognitive domains

| Domain                      | β     | SE   | P     | R²   |
|-----------------------------|-------|------|-------|------|
| Memory                      | -0.007| 0.003| 0.022 | 0.115|
| Working memory              | -0.002| 0.004| 0.539 | 0.006|
| Flexibility                 | -0.001| 0.003| 0.706 | 0.142|
| Processing speed            | 0.005 | 0.005| 0.330 | 0.117|
Visuo-spatial problem solving 0.011 0.004 0.007** 0.169

All CRF allometric scaled models are controlling for age, education and socioeconomic status as a covariate. R² are adjusted for all predictors.

Table S4. Associations between Regicor and cognitive domains.

|                      | β    | SE    | P      | R²   |
|----------------------|------|-------|--------|------|
| Memory               | -2.587 | 0.392 | <0.001 | 0.128 |
| Working memory       | -0.558 | 0.368 | 0.130  | 0.004 |
| Flexibility          | -1.105 | 0.269 | <0.001 | 0.081 |
| Processing speed     | -2.331 | 0.394 | <0.001 | 0.091 |
| Visuo-spatial problem solving | -1.253 | 0.365 | 0.0006 | 0.079 |

All models are controlling for monthly incomes and education as covariates. R² are adjusted for all predictors. *survives false discovery rate (FDR) corrections

Table S5. Regicor Standardized beta coefficients.

|                      | β    | P      |
|----------------------|------|--------|
| Memory               | -0.303 | <0.001 |
| Working memory       | -0.074 | 0.130  |
| Flexibility          | -0.193 | <0.001 |
| Processing speed     | -0.274 | <0.001 |
| Visuo-spatial problem solving | -0.160 | 0.0006 |

All models are controlling for age and education as covariates. R² are adjusted for all predictors. *survives FDR corrections

Table S6. Associations between Regicor and anatomical regions of cortical thickness.

| Cluster | Hemisphere | Anatomical ROI       | Size     |
|---------|------------|----------------------|----------|
| 1       | Left       | Postcentral          | 2525.44  |
| 2       | Left       | Insula               | 2343.16  |
| 3       | Left       | Pars triangularis    | 1995.18  |
| 4       | Left       | Superior frontal     | 1103.54  |
Table S7. Associations between VO₂ peak and anatomical regions of cortical thickness in the whole sample.

| Cluster | Hemisphere | Anatomical ROI            | Size   |
|---------|------------|----------------------------|--------|
| 1       | Left       | Rostral middle frontal     | 1465.59|

Table S8. Associations between VO₂ peak and anatomical regions of cortical thickness in the 40-54 years old group.

- No significant results.

Table S9. Associations between VO₂ peak and anatomical regions of cortical thickness in the 55 and above years old group.

| Cluster | Hemisphere | Anatomical ROI            | Size   |
|---------|------------|----------------------------|--------|
| 1       | Left       | Rostral middle frontal     | 1634.39|
| 2       | Left       | Superior temporal          | 1168.92|

| Outcomes | Total effect | ADE   | ACME |
|----------|--------------|-------|------|
Table S10. Each model was adjusted for age, biological sex, monthly incomes, education, waist perimeter and body mass index. ADE = average direct effect; ACME = average causal mediation effect. Statistical significance at p < 0.05 and 95% CI not including 0.

Table S11. Associations between Framingham and anatomical regions of cortical thickness.

| Cluster | Hemisphere | Anatomical ROI | Size     |
|---------|------------|----------------|----------|
| 1       | Left       | Post central   | 3518.9   |
| 2       | Left       | Pars triangularis | 1928.37 |
| 3       | Left       | Insula         | 1428.72  |
| 4       | Left       | Cuneus         | 1181.96  |
| 5       | Left       | Lingual        | 845.33   |
| 6       | Left       | Caudal anterior cingulate | 833.6 |
| 7       | Left       | Superior parietal | 589.08 |
| 8       | Left       | Inferior parietal | 587.35 |
| 9       | Left       | Transverse temporal | 509.91 |
| 10      | Left       | Rostral middle frontal | 376.1 |
| 11      | Left       | Precentral      | 357.23   |
| 1       | Right      | Inferior parietal | 9432.87 |
| 2       | Right      | Parahippocampal | 1962.3  |
| 3       | Right      | Cuneus         | 1806.08  |
| 4       | Right      | Supramarginal  | 1367.08  |
| 5       | Right      | Precentral     | 568.03   |
| 6       | Right      | Lateral occipital | 462.1 |
| 7       | Right      | Superior frontal | 448.49 |
| Outcomes                          | Total effect | ADE | ACME |
|----------------------------------|--------------|-----|------|
|                                  | Beta (95%CI) | Beta (95%CI) | Beta (95%CI) |
| Visuospatial problem solving     |              |     |      |
| Left postcentral                 |              |     |      |
| gyrus                            | -0.05(-0.08, -0.02)* | -0.03(-0.07, 0.00)* | -0.01(-0.02, 0.00)* |
| Left parstriangularis            | -0.05(-0.08, -0.02)* | -0.03(-0.07, 0.00)* | -0.01(-0.02, 0.00)* |
| Left insula                      | -0.05(-0.08, -0.02)* | -0.03(-0.07, 0.00) | -0.01(-0.02, -0.01)* |
| Left cuneus                      | -0.05(-0.08, -0.02)* | -0.04(-0.07, -0.01)* | -0.01(-0.02, 0.00)* |
| Left lingual                     | -0.05(-0.08, -0.02)* | -0.04(-0.08, -0.02)* | -0.002(-0.01, 0.01) |
| Left caudal anterior cingulate gyrus | -0.05(-0.08, -0.02)* | -0.03(-0.07, 0.00)* | -0.01(-0.02, -0.01)* |
| Left superior parietal           | -0.05(-0.08, -0.01)* | -0.04(-0.08, -0.01)* | -0.006(-0.01, 0.00) |
| Left inferior parietal           | -0.05(-0.08, -0.02)* | -0.04(-0.08, -0.01)* | -0.005(-0.01, 0.01) |
| Left transverse temporal gyrus   | -0.05(-0.08, -0.02)* | -0.04(-0.07, -0.01)* | -0.009(-0.01, 0.00)* |
| Left rostral middle frontal gyrus | -0.05(-0.08, -0.02)* | -0.04(-0.08, -0.01)* | -0.004(-0.01, 0.00) |
| Left precentral gyrus            | -0.05(-0.08, -0.02)* | -0.04(-0.08, -0.01)* | -0.002(-0.01, 0.01) |
| Right inferior parietal gyrus    | -0.05(-0.08, -0.02)* | -0.04(-0.08, -0.01)* | -0.009(-0.02, 0.00)* |
| Right parahippocampal region     | -0.05(-0.08, -0.02)* | -0.05(-0.08, -0.02)* | -0.0001(-0.011, 0.01) |
| Right cuneus                     | -0.05(-0.08, -0.02)* | -0.04(-0.07, -0.01)* | -0.01(-0.02, 0.00) |
| Right supramarginal gyrus        | -0.05(-0.08, -0.02)* | -0.03(-0.07, 0.00)* | -0.01(-0.02, -0.01)* |
| Right precentral gyrus           | -0.05(-0.08, -0.02)* | -0.05(-0.08, -0.01)* | -0.0002(-0.008, 0.01) |
| Right lateral occipital gyrus    | -0.05(-0.08, -0.02)* | -0.05(-0.08, -0.02)* | 0.0008(-0.006, 0.01) |
| Right superior frontal gyrus     | -0.05(-0.08, -0.02)* | -0.04(-0.08, -0.02)* | -0.001(-0.10, 0.01) |
Table S12A. Each model was adjusted for monthly incomes and education. ADE = average direct effect; ACME = average causal mediation effect. Statistical significance at p < 0.05 and 95% CI not including 0.

| Outcomes                          | Total effect Beta (95%CI) | ADE Beta (95%CI) | ACME Beta (95%CI) |
|-----------------------------------|---------------------------|------------------|-------------------|
| **Processing speed**              |                           |                  |                   |
| Left postcentral gyrus            | -0.11(-0.14, -0.08)*      | -0.10(-0.14, -0.08)* | -0.005(-0.18, 0.01) |
| Left parstriangularis             | -0.11(-0.14, -0.08)*      | -0.10(-0.14, -0.07)* | -0.008(-0.02, 0.00) |
| Left insula                       | -0.11(-0.14, -0.08)*      | -0.10(-0.14, -0.08)* | -0.004(-0.01, 0.01) |
| Left cuneus                       | -0.11(-0.14, -0.08)*      | -0.10(-0.14, -0.08)* | -0.003(-0.01, 0.00) |
| Left lingual                      | -0.11(-0.14, -0.08)*      | -0.11(-0.14, -0.09)* | 0.003(-0.005, 0.01) |
| Left caudal anterior cingulate gyrus | -0.11(-0.14, -0.08)*  | -0.10(-0.14, -0.08)* | -0.005(-0.01, 0.00) |
| Left superior parietal gyrus       | -0.11(-0.14, -0.08)*      | -0.10(-0.14, -0.08)* | -0.004(-0.01, 0.00) |
| Left inferior parietal gyrus       | -0.11(-0.14, -0.08)*      | -0.11(-0.14, -0.08)* | -0.001(-0.01, 0.01) |
| Left transverse temporal gyrus     | -0.11(-0.14, -0.08)*      | -0.10(-0.14, -0.07)* | -0.006(-0.01, 0.00) |
| Left rostral middle frontal gyrus  | -0.11(-0.14, -0.08)*      | -0.11(-0.14, -0.08)* | -0.001(-0.009, 0.01) |
| Left precentral gyrus              | -0.11(-0.14, -0.08)*      | -0.11(-0.15, -0.08)* | 0.0009(-0.006, 0.01) |
| Right inferior parietal gyrus      | -0.11(-0.14, -0.08)*      | -0.10(-0.13, -0.07)* | -0.01(-0.02, 0.00) |
| Right parahippocampal region       | -0.11(-0.14, -0.08)*      | -0.10(-0.14, -0.08)* | -0.005(-0.01, 0.01) |
| Right cuneus                       | -0.11(-0.14, -0.08)*      | -0.10(-0.13, -0.07)* | -0.01(-0.02, 0.00)* |
| Right supramarginal gyrus          | -0.11(-0.14, -0.08)*      | -0.10(-0.14, -0.08)* | -0.006(-0.01, 0.00) |
| Right precentral gyrus             | -0.11(-0.14, -0.08)*      | -0.11(-0.14, -0.08)* | -0.001(-0.009, 0.00) |
Right lateral occipital gyrus

-0.11(-0.14, -0.08)*  
-0.11(-0.14, -0.08)*  
0.002(-0.007, 0.01)

Right superior frontal gyrus

-0.11(-0.14, -0.08)*  
-0.11(-0.14, -0.08)*  
-0.001(-0.01, 0.01)

Table S12B. Each model was adjusted for monthly incomes and education. ADE = average direct effect; ACME = average causal mediation effect. Statistical significance at p < 0.05 and 95% CI not including 0.

| Outcomes                           | Total effect | ADE         | ACME         |
|------------------------------------|--------------|-------------|--------------|
|                                    | Beta (95%CI) | Beta (95%CI)| Beta (95%CI) |
| **Flexibility**                    |              |             |              |
| Left postcentral                   |              |             |              |
| gyrus                              | -0.05(-0.07, -0.03)* | -0.03(-0.06, -0.01)* | -0.01(-0.02, 0.00)* |
| Left pars                           |              |             |              |
| triangularis                       | -0.05(-0.07, -0.03)* | -0.04(-0.07, -0.02)* | -0.007(-0.01, 0.00) |
| Left insula                         | -0.05(-0.07, -0.03)* | -0.04(-0.06, -0.02)* | -0.007(-0.01, 0.00)* |
| Left cuneus                         | -0.05(-0.07, -0.03)* | -0.04(-0.07, -0.02)* | -0.005(-0.01, 0.00) |
| Left lingual                        | -0.05(-0.07, -0.03)* | -0.05(-0.07, -0.03)* | -0.001(-0.008, 0.01) |
| Left caudal anterior cingulate      |              |             |              |
| gyrus                              | -0.05(-0.07, -0.03)* | -0.04(-0.06, -0.02)* | -0.009(-0.01, 0.00)* |
| Left superior                       |              |             |              |
| parietal gyrus                      | -0.05(-0.07, -0.03)* | -0.05(-0.07, -0.03)* | -0.001(-0.009, 0.00) |
| Left inferior                       |              |             |              |
| aprietal gyrus                      | -0.05(-0.07, -0.03)* | -0.05(-0.07, -0.02)* | -0.001(-0.009, 0.01) |
| Left transverse                     |              |             |              |
| temporal gyrus                      | -0.05(-0.07, -0.03)* | -0.04(-0.06, -0.02)* | -0.008(-0.01, 0.00)* |
| Left rostral middle                 |              |             |              |
| frontal gyrus                       | -0.05(-0.07, -0.03)* | -0.04(-0.07, -0.02)* | -0.003(-0.009, 0.00) |
| Left precentral                     |              |             |              |
| gyrus                              | -0.05(-0.07, -0.03)* | -0.04(-0.07, -0.02)* | -0.002(-0.008, 0.00) |
| Right inferior                      |              |             |              |
| parietal gyrus                      | -0.05(-0.07, -0.03)* | -0.03(-0.06, -0.01)* | -0.01(-0.02, 0.00)* |
| Region                                | Total effect | ADE   | ACME          |
|---------------------------------------|--------------|-------|---------------|
| Right parahippocampal region           | -0.05(-0.07, -0.03)* | -0.04(-0.06, -0.02)* | -0.007(-0.01, 0.00) |
| Right cuneus                          | -0.05(-0.07, -0.03)* | -0.04(-0.06, -0.02)* | -0.009(-0.01, 0.00)* |
| Right supramarginal gyrus             | -0.05(-0.07, -0.03)* | -0.04(-0.06, -0.01)* | -0.01(-0.02, 0.00)* |
| Right precentral gyrus                | <0.001(-<0.001, - 0.03)* | <0.001(-<0.001, - 0.01)* | <0.001(-<0.001, 0.00) |
| Right lateral occipital gyrus         | -0.05(-0.07, -0.03)* | -0.05(-0.07, -0.03)* | -0.0009(-0.00, 0.00) |
| Right superior frontal gyrus          | -0.05(-0.07, -0.03)* | -0.03(-0.06, -0.01)* | -0.01(-0.02, 0.00) |

Table S12C. Each model was adjusted for monthly incomes and education. ADE = average direct effect; ACME = average causal mediation effect. Statistical significance at p < 0.05 and 95% CI not including 0.
| Region                      | ADE (Lower, Upper) | ACME (Lower, Upper) | Standard Error (Lower, Upper) |
|-----------------------------|--------------------|--------------------|-------------------------------|
| Left transverse temporal gyrus | -0.11 (-0.15, -0.08)* | -0.11 (-0.14, -0.07)* | -0.004 (-0.01, 0.00) |
| Left rostral middle frontal gyrus | -0.11 (-0.15, -0.08)* | -0.11 (-0.14, -0.07)* | -0.004 (-0.01, 0.00) |
| Left precentral gyrus        | -0.11 (-0.15, -0.08)* | -0.11 (-0.15, -0.08)* | -0.0007 (-0.00, 0.01) |
| Right inferior parietal gyrus | -0.11 (-0.15, -0.08)* | -0.10 (-0.14, -0.06)* | -0.01 (-0.02, 0.00)* |
| Right parahippocampal region | -0.11 (-0.15, -0.08)* | -0.11 (-0.14, -0.07)* | -0.006 (-0.01, 0.00) |
| Right cuneus                 | -0.11 (-0.15, -0.08)* | -0.10 (-0.13, -0.06)* | -0.01 (-0.02, 0.00)* |
| Right supramarginal gyrus    | -0.11 (-0.15, -0.08)* | -0.11 (-0.14, -0.07)* | -0.006 (-0.01, 0.00) |
| Right precentral gyrus       | -0.11 (-0.15, -0.08)* | -0.11 (-0.15, -0.08)* | -0.001 (-0.01, 0.00) |
| Right lateral occipital gyrus| -0.11 (-0.15, -0.08)* | -0.11 (-0.15, -0.08)* | -0.0007 (-0.00, 0.01) |
| Right superior frontal gyrus | -0.11 (-0.15, -0.08)* | -0.11 (-0.15, -0.08)* | -0.0007 (-0.00, 0.01) |

**Table S12D.** Each model was adjusted for monthly incomes and education. ADE = average direct effect; ACME = average causal mediation effect. Statistical significance at p < 0.05 and 95% CI not including 0.
Figure S1. REGICOR and cortical thickness.

When using the Catalan-population adjusted Framingham risk score, we see similar patterns of associations with cortical thickness compared to those when using Framingham.
Figure S2. CRF and cortical thickness.

(A). Significant correlations were seen between VO2 peak and left rostral middle frontal gyrus (r mean=0.118). (B) The older middle age group (55 and above) showed that left rostral middle frontal gyrus (r mean= 0.172) and left superior temporal gyrus (r mean= 0.169) were positively associated to VO2 peak.
Figure S3. Framingham and cortical thickness.

All plots illustrating the relationship between each significant cluster and cardiovascular risk (Framingham score). Distributed clusters across multiple cortical regions were associated with cardiovascular risk (Framingham 5-year risk score). Those specific clusters were left post central (r mean= -0.170), left pars triangularis (r mean= -0.170), left insula (r mean= -0.170), left cuneus gyrus (r mean= -0.172), left lingual (r mean= -0.164), left caudal anterior cingulate gyrus (r mean= -0.184), left superior parietal gyrus (r mean= -0.158), left inferior parietal gyrus (r mean= -0.160), left transverse temporal gyrus (r mean= -0.169). left rostral middle frontal (r mean= -0.161) and left precentral gyrus (r mean= -0.170). On the right hemisphere, the correlations were in right inferior parietal gyrus (r mean= -0.176), para hippocampal region (r mean= -0.184), right cuneus (r mean= -0.192), right supramarginal gyrus (r mean= -0.175), right precentral gyrus (r mean= -0.165), right lateral occipital gyrus (r mean= -0.160), and right superior frontal gyrus (r mean= -0.163).
A significant positive association between physical activity levels (total weekly MET [metabolic equivalent of task]) and VO$_2$ peak, controlling for age, biological sex, education, monthly incomes, BMI (body mass index), and waist was found.