

**S1 Figure:** Assessment time point of exposure and outcome within the DONALD study

Lifestyle factors were assessed – if available – repeatedly per individual. Anthropometric markers and blood markers were assessed once per individual. All available assessments of lifestyle factors prior to outcome assessment were used to construct the lifestyle score for each individual.

**S1 Table:** Participants reference fulfilment across categories of the lifestyle score (in %)

|  |  |  |
| --- | --- | --- |
|  | Lifestyle score categories (points) |  |
|  | 2-2.9 | 2-2.9 | 2-2.9 | 2-2.9 | *P*trend2 |
| Diet (recommended age-specific portions in ≥3 food groups/d)1 | 3.3 | 3.0 | 11.5 | 69.2 | <0.0001 |
| MVPA (≥ age-specific reference/d) | 3.3 | 4.0 | 21.9 | 61.5 | <0.0001 |
| Sedentary behaviour (≤ age-specific reference/d) | 0 | 1.0 | 11.5 | 53.9 | <0.0001 |
| Sleep duration (within age-specific reference/d) | 30.0 | 48.5 | 59.4 | 84.6 | 0.0004 |
| BMI SDS (normal weight) | 16.7 | 63.4 | 85.4 | 92.3 | <0.0001 |

MVPA: moderate-to-vigorous physical activity, BMI: body mass index, SDS: standard deviation score. 1Age-specific portion sizes were published elsewhere(1), 2*P*trend was calculated using age- and sex-adjusted linear regression models.

**S2 Table:** Associations between adolescence lifestyle score and fatty liver indices in young adulthood using WHtR1 in the adolescent lifestyle score instead of BMI SDS2

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Basic model | Multivariable adjusted model  |
|  | n | ß-estimate (95% CI) | *p*-Value | ß-estimate (95% CI) | *p*-Value |
| **Overall** |  |  |  |  |  |
| HSI | 240 | -6.7 (-9.4 to -4.0) | **<0.0001** | -5.9 (-8.6 to -3.2) | **<0.0001** |
| FLI | 240 | -35.1 (-45.1 to -22.9) | **<0.0001** | -32.4 (-42.9 to -20.0) | **<0.0001** |
| **Men** |  |  |  |  |  |
| HSI | 124 | -9.4 (-13.1 to -5.5) | **<0.0001** | -8.7 (-12.5 to -4.7) | **0.0001** |
| FLI | 124 | -46.6 (-58.0 to -32.1) | **<0.0001** | -45.2 (-57.2 to -30.0) | **<0.0001** |
| **Women** |  |  |  |  |  |
| HSI | 116 | -2.9 (-6.5 to 0.9) | 0.13 | -2.1 (-5.7 to 1.7) | 0.27 |
| FLI | 116 | -14.7 (-33.4 to 9.1) | 0.20 | -12.6 (-31.9 to 12.2) | 0.29 |

Associations were analysed using multiple linear regression. Values displayed in bold are significant at 0.05 significance level. Basic model: adjusted for age and sex (for all subjects only), Multivariable adjusted model: Basic model + additionally adjusted for maternal overweight. HSI: hepatic steatosis index, FLI: fatty liver index. WHtR: waist-to-height ratio. 1Lifestyle score consists of the factors diet, moderate-to-vigorous physical activity, sedentary behaviour, sleep duration and WHtR. 2Log transformed ß values were back transformed.

**S3 Table:** Associations between modified version of the adolescence lifestyle score and fatty liver indices in young adulthood1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Adolescent lifestyle score without diet | Adolescent lifestyle score without MVPA | Adolescent lifestyle score without sedentary behaviour | Adolescent lifestyle score without sleep duration | Adolescent lifestyle score without BMI SDS |
|  | ß (95% CI) | *P*-value | ß (95% CI) | *P*-value | ß (95% CI) | *P*-value | ß (95% CI) | *P*-value | ß (95% CI) | *P*-value |
| **Overall** |  |  |  |  |  |  |  |  |  |  |
| HSI | -6.0 (-9.0 to -3.0) | **0.0002** | -8.1 (-11.1 to -4.9) | **<0.0001** | -6.9 (-9.8 to -4.0) | **<0.0001** | -5.6 (-8.4 to -2.8) | **0.0002** | -2.8 (-5.4 to -0.2) | **0.0350** |
| FLI | -37.7 (-48.8 to -24.2) | **<0.0001** | -40.3 (-51.4 to -26.7) | **<0.0001** | -38.0 (-48.8 to -24.9) | **<0.0001** | -28.2 (-39.9 to -14.1) | **0.0003** | -17.6 (-30.0 to -3.0) | **0.0201** |
| **Men** |  |  |  |  |  |  |  |  |  |  |
| HSI | -7.7 (-12.0 to -3.3) | **0.0010** | -10.8 (-15.2 to -6.3) | **<0.0001** | -9.1 (-13.2 to -4.8) | **0.0001** | -7.5 (-11.5 to -3.4) | **0.0005** | -3.1 (-7.0 to 0.8) | 0.12 |
| FLI | -49.9 (-61.5 to -34.8) | **<0.0001** | -50.3 (-62.8 to -33.8) | **<0.0001** | -45.8 (-58.4 to -29.3) | **<0.0001** | -37.7 (-51.3 to -20.3) | **0.0002** | -20.2 (-35.7 to -1.1) | **0.0393** |
| **Women** |  |  |  |  |  |  |  |  |  |  |
| HSI | -4.1 (-8.2 to 0.1) | 0.06 | -3.9 (-8.1 to 0.5) | 0.08 | -3.4 (-7.4 to 0.9) | 0.11 | -2.8 (-6.6 to 1.1) | 0.16 | -1.7 (-5.0 to 1.8) | 0.34 |
| FLI | -20.7 (-40.7 to 6.1) | 0.12 | -21.6 (-41.9 to 5.7) | 0.11 | -23.3 (-42.3 to 1.9) | 0.07 | -11.5 (-31.9 to 15.1) | 0.36 | -8.4 (-28.5 to 17.3) | 0.48 |

Linear regression model was adjusted for age, sex (for all subjects only), maternal overweight and the omitted lifestyle factor (e.g. hours while sitting (h/d) or sleep duration (h/d)). Values displayed in bold are significant at 0.05 significance level. MVPA: moderate-to-vigorous physical activity, BMI: body mass index, SDS: standard deviation score, HSI: hepatic steatosis index, FLI: fatty liver index. 1Log transformed ß values were back transformed.

**S4 Table**: Association between adolescent lifestyle score and fatty liver indices in young adulthood in different subsamples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Subsample | Risk factor | n | ß (95% CI) | *P*-value |
| ≥2 assessments of each factor | **Overall**HSIFLI**Men**HSIFLI**Women**HSIFLI | 221221117117104104 | -6.4 (-9.1 to -3.6)-37.0 (-47.1 to -24.9)-8.5 (-12.4 to -4.5)-45.1 (-47.1 to -24.9)-2.8 (-12.4 to 4.5)-21.2 (-38.9 to 1.7) | **<0.0001****<0.0001****0.0001****<0.0001**0.150.07 |
| More correct than potentially underreported reported 3dWR | **Overall**HSIFLI**Men**HSIFLI**Women**HSIFLI | 217217107107110110 | -5.4 (-8.1 to -2.6)-29.2 (-40.9 to -15.1)-7.1 (-11.0 to -2.9)-37.9 (-51.8 to -20.1)-2.9 (-6.6 to 1.1)-13.5 (-33.9 to 13.2) | **0.0003****0.0002****0.0012****0.0003**0.150.29 |

Linear regression model was adjusted for age, sex (for all subjects only) and maternal overweight. Values displayed in bold are significant at 0.05 significance level. HSI: Hepatic steatoses index, FLI: Fatty liver index. 1Log transformed ß values were back transformed.

1. Schnermann ME, Schulz CA, Herder C, et al. (2021) A lifestyle pattern during adolescence is associated with cardiovascular risk markers in young adults: results from the DONALD cohort study. J Nutr Sci;10:e92.