**Table S1.** Model fit for models with 2-10 statuses (latent transition analysis)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Log-likelihood** | **Degrees of freedom** | **Likelihood-Ratio G2** | **AIC** | **BIC** | **Number of latent statuses** |
| -23697.5 | 1048552 | 12420.92 | 12466.92 | 12599.84 | 2 |
| -23509.1 | 1048537 | 12044.16 | 12120.16 | 12339.76 | 3 |
| -23154 | 1048520 | 11334.02 | 11444.02 | 11761.86 | 4 |
| -22998 | 1048501 | 11021.7 | 11169.7 | **11597.3** | **5** |
| -22924.6 | 1048480 | 10875.13 | 11065.13 | 11614.14 | 6 |
| -22861.3 | 1048457 | 10748.46 | 10984.46 | 11666.39 | 7 |
| -22803 | 1048432 | 10632 | 10918 | 11744.41 | 8 |
| -22738.9 | 1048405 | 10503.79 | 10843.79 | 11826.23 | 9 |
| -22698.8 | 1048376 | 10423.58 | 10821.58 | 11971.61 | 10 |

*Abbreviations: AIC, Akaike Information Criterion; BIC, Bayesian Information Criterion.*

**Table S2**. Test of measurement invariance across time

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **G2** | **Df** | **AIC** | **BIC** | **Log-likelihood** | **p-valuea** |
| Model without measurement invariance  | 10940,5 | 1048451 | 11188 | 11905 | -22957 | - |
| Model with measurement invariance | 11021,7 | 1048501 | 11169 | 11597 | -22998 | - |
| Differenceb | 81.2 | 50 | **-** | **-** | 41 | 0.003 |

*Abbreviations: AIC, Akaike Information Criterion; BIC, Bayesian Information Criterion; Df, Degree of freedom; G2, test for likelihood ratio statistic.*

*a p-value of measurement invariance test.*

*b Differenceindicates likelihood-ratio test and difference of degree of freedom between the two models*

**Table S3.** Factors associated with lifestyle behaviour profiles at T0 (baseline): univariable analyses

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Profile 1*Healthy diet and high PA* | Profile 2*Big eater and moderate to high PA* | Profile 3*Healthy diet and low PA* | Profile 4*Restrictive diet and moderate PA* | Profile 5*Sugar products, nibbling and moderate PA* |
| n= 188 | OR | [95% CI] | n= 570 | OR | [95% CI] | n= 745 | Ref. | n= 493 | OR | [95% CI] | n= 314 | OR | [95% CI] |
| Gender |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Girls | 66 | Ref. | Ref. | 267 | Ref. | Ref. | 484 | . | 302 | Ref. | Ref. | 233 | Ref. | Ref. |
| Boys | 122 | **3.43** | **[2.4;4.8]** | 303 | **2.10** | **[1.7;2.6]** | 261 | . | 191 | 1.17 | [0.9;1.5] | 161 | 1.28 | [1.0;1.6] |
| Age at entering in grade 10  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Classic or advanced | 147 | Ref. | Ref. | 398 | Ref. | Ref. | 633 | . | 348 | Ref. | Ref. | 263 | Ref. | Ref. |
| Late placement | 41 | **1.58** | **[1.1;2.3]** | 172 | **2.44** | **[1.9;3.2]** | 112 | . | 145 | **2.35** | **[1.8;3.1]** | 131 | **2.81** | **[2.1;3.8]** |
| Socio-economic status |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Highly advantaged | 16 | Ref. | Ref. | 39 | Ref. | Ref. | 89 | . | 38 | Ref. | Ref. | 24 | Ref. | Ref. |
| Advantaged | 43 | 1.37 | [0.7;2.6] | 119 | 1.55 | [1.0;2.4] | 175 | . | 95 | 1.27 | [0.8;2.0] | 68 | 1.44 | [0.8;2.4] |
| Intermediate | 55 | 1.20 | [0.7;2.2] | 177 | **1.59** | **[1.0;2.4]** | 254 | . | 132 | 1.22 | [0.8;1.9] | 118 | **1.72** | **[1.0;2.8]** |
| Less advantaged | 47 | 1.63 | [0.9;3.0] | 145 | **2.07** | **[1.3;3.2]** | 160 | . | 136 | **1.99** | **[1.3;3.1]** | 128 | **2.97** | **[1.8;4.9]** |
| Highly less advantaged | 27 | **2.24** | **[1.1;4.5]** | 90 | **3.06** | **[1.9;5.0]** | 67 | . | 92 | **3.22** | **[2.0;5.3]** | 56 | **3.10** | **[1.7;5.5]** |
| *Test for linear trend*a |  | **1.18** | **[1.0;1.3]** |  | **1.26** | **[1.1;1.4]** |  | . |  | **1.33** | **[1.2;1.5]** |  | **1.35** | **[1.2;1.5]** |
| Overweight/obesity |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No | 145 | Ref. | Ref. | 487 | Ref. | Ref. | 596 | . | 366 | Ref. | Ref. | 340 | Ref. | Ref. |
| Yes | 40 | 1.12 | [0.7;1.7] | 75 | **0.62** | **[0.5;0.8]** | 147 | . | 118 | 1.31 | [1.0;1.7] | 51 | **0.61** | **[0.4;0.9]** |
| Intervention strategies |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Educational strategy |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No | 79 | Ref. | Ref. | 242 | Ref. | Ref. | 315 | . | 233 | Ref. | Ref. | 191 | Ref. | Ref. |
| Yes | 109 | 1.01 | [0.7;1.4] | 328 | 0.99 | [0.8;1.2] | 430 | . | 260 | 0.82 | [0.6;1.0] | 203 | 0.78 | [0.6;1.0] |
| Environmental strategy |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No | 99 | Ref. | Ref. | 284 | Ref. | Ref. | 381 | . | 245 | Ref. | Ref. | 201 | Ref. | Ref. |
| Yes | 89 | 0.94 | [0.7;1.3] | 286 | 1.05 | [0.8;1.3] | 364 | . | 248 | 1.06 | [0.8;1.3] | 193 | 1.00 | [0.8;1.3] |
| Screening and care strategy |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No | 94 | Ref. | Ref. | 312 | Ref. | Ref. | 385 | . | 257 | Ref. | Ref. | 200 | Ref. | Ref. |
| Yes | 94 | 1.07 | [0.8;1.5] | 258 | 0.88 | [0.7;1.1] | 360 | . | 236 | 0.98 | [0.8;1.2] | 194 | 1.04 | [0.8;1.3] |

*Abbreviations: OR, odds ratio; CI, confidence interval; Ref, reference.*

*a Socioeconomic status (IPSE classes) used as a discrete variable*

*For all analyses, inactive group was the reference group*

*OR and 95% CI in bold indicate p-value<0.05.*

**Table S4.** Factors associated with lifestyle behaviours profiles changes using multinomial logistic regression model: univariable analyses

|  |  |  |  |
| --- | --- | --- | --- |
|  | Favourable changes1 | Mixed changes2 | Unfavourable changes3 |
| n= 671 | OR | [95% CI] | n= 905 | Ref. | n= 814 | OR | [95% CI] |
| Gender |  |  |  |  |  |  |  |  |
| Girls | 370 | Ref. | Ref. | 577 | . | 405 | Ref. | Ref. |
| Boys | 301 | **1.43** | **[1.2; 1.7]** | 328 | . | 409 | **1.78** | **[1.5; 2.1]** |
| Age at entering in grade 10  |  |  |  |  |  |  |  |  |
| Classic or advanced | 498 | Ref. | Ref. | 737 | . | 554 | Ref. | Ref. |
| Late placement | 173 | **1.52** | **[1.2; 1.9]** | 168 | . | 260 | **2.06** | **[1.6; 2.6]** |
| Socio-economic status |  |  |  |  |  |  |  |  |
| Highly advantaged | 56 | Ref. | Ref. | 93 | . | 57 | Ref. | Ref. |
| Advantaged | 132 | 1.03 | [0.7; 1.5] | 212 | . | 156 | 1.20 | [0.8; 1.8] |
| Intermediate | 202 | 1.13 | [0.8; 1.6] | 297 | . | 237 | 1.30 | [0.9; 1.9] |
| Less advantaged | 182 | 1.47 | [1.0; 2.2] | 206 | . | 228 | **1.81** | **[1.2; 2.6]** |
| Highly less advantaged | 99 | **1.69** | **[1.1; 2.6]** | 97 | . | 136 | **2.29** | **[1.5; 3.5]** |
| *Test for linear trend* a |  | **1.16** | **[1.1; 1.3]** |  | . |  | **1.23** | **[1.1; 1.3]** |
| Overweight/obesity |  |  |  |  |  |  |  |  |
| No | 506 | Ref. | Ref. | 721 | . | 707 | Ref. | Ref. |
| Yes | 157 | 1.25 | [1.0; 1.6] | 179 | . | 95 | **0.54** | **[0.4; 0.7]** |
| Intervention strategies |  |  |  |  |  |  |  |  |
| Educational strategy |  |  |  |  |  |  |  |  |
| No | 308 | Ref. | Ref. | 379 | . | 373 | Ref. | Ref. |
| Yes | 363 | 0.85 | [0.7; 1.0] | 526 | . | 441 | 0.85 | [0.7; 1.0] |
| Environmental strategy |  |  |  |  |  |  |  |  |
| No | 351 | Ref. | Ref. | 456 | . | 403 | Ref. | Ref. |
| Yes | 320 | 0.93 | [0.8; 1.1] | 449 | . | 411 | 1.04 | [0.9; 1.2] |
| Screening and care strategy |  |  |  |  |  |  |  |  |
| No | 358 | Ref. | Ref. | 468 | . | 422 | Ref. | Ref. |
| Yes | 313 | 0.94 | [0.8; 1.1] | 437 | . | 392 | 0.99 | [0.8; 1.2] |

*Abbreviations: OR, odds ratio; CI, confidence interval; Ref, reference.*

*1Adolescents with improvement in EB and PA, or improvement in PA and no change in EB, or reciprocally from T0 to T2.*

*2Adolescents with improvement in EB and deterioration in PA from T0 to T2, or reciprocally.*

*3 Adolescents with deterioration in EB and PA, or improvement in PA and no change in EB, or reciprocally from T0 to T2.*

*a Socioeconomic status (IPSE classes) used as a discrete variable.*

*OR and 95% CI in bold indicate p-value<0.05.*



**Figure S1**. Flow chart of the study sample selection



**Figure S2.** Lifestyle behaviour profiles identified with latent transition analysis at T0 (baseline) among adolescents (n=2390): 5-statuses model

*Abbreviations: PA, physical activity; ST, sedentary time.*