**Table S1** Sample characteristics [(mean (SD) or n (percentage)] in boys over survey year from 2004 to 2015

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **2004 (n=196)** | **2006 (n=304)** | **2009 (n=296)** | **2011 (n=278)** | **2015 (n=107)** | **Time trend (*p*)** |
| **Participants’ personal characteristics** |  |  |  |  |  |
| Age(years) | 9.11 (1.50) | 9.86 (2.03) | 10.23 (1.92) | 9.95 (2.11) | 11.85 (0.83) | <0.001 |
| BMI z score | -0.07 (0.83) | -0.03 (0.89) | -0.04 (0.99) | 0.06 (1.13) | 0.17 (1.18) | 0.443 |
| Waist circumference  | 58.62 (6.71) | 59.57 (8.63) | 62.39 (10.86) | 61.68 (11.21) | 65.69 (13.66) | <0.001 |
| Physical exercise frequency per week |  |  |  |  |  |
| <3 | 82 (48.2) | 58 (27.9) | 62 (27.6) | 57 (29.8) | 41 (43.6) | <0.001 |
| 3-7 | 70 (41.2) | 83 (39.9) | 108 (48.0) | 89 (46.6) | 33 (35.1) |  |
| ≥8 | 18 (10.6) | 67 (32.2) | 55 (24.4) | 45 (23.6) | 20 (21.3) |  |
| Screen time per day |  |  |  |  |  |  |
| <1h | 61 (32.8) | 78 (26.7) | 65 (22.6) | 65 (24.3) | 24 (23.8) | 0.080 |
| 1-2h | 73 (39.2) | 99 (33.9) | 108 (37.6) | 106 (39.6) | 32 (31.7) |  |
| ≥3h | 52 (28.0) | 115 (39.4) | 114 (39.7) | 97 (36.2) | 45 (44.6) |  |
| **Family and community information** |  |  |  |  |  |  |
| Parents hypertension history |  |  |  |  |  |  |
| No | 182 (97.8) | 272 (97.5) | 262 (96.0) | 230 (93.9) | 81 (90.0) | 0.009 |
| Yes | 4 (2.2) | 7 (2.5) | 11 (4.0) | 15 (96.1) | 9 (10.0) |  |
| Per capital house income |  |  |  |  |  |  |
| Tertiles 1  | 79 (40.9) | 125 (42.1) | 65 (22.4) | 60 (22.0) | 22 (21.0) | <0.001 |
| Tertiles 2  | 75 (38.9) | 112 (37.7) | 113 (39.0) | 93 (34.1) | 20 (19.0) |  |
| Tertiles 3 | 39 (20.2) | 60 (20.2) | 112 (38.6) | 120 (44.0) | 63 (60.0) |  |
| Urbanization index |  |  |  |  |  |  |
| Tertiles 1 | 62 (31.6) | 115 (37.8) | 115 (38.9) | 110 (39.6) | 41 (38.3) | 0.545 |
| Tertiles 2 | 75 (38.3) | 96 (31.6) | 95 (32.1) | 95 (34.2) | 41 (38.3) |  |
| Tertiles 3 | 59 (30.1) | 93 (30.6) | 86 (29.1) | 73 (26.3) | 25 (23.4) |  |
| Region |  |  |  |  |  |  |
| Central | 52 (26.5) | 74 (24.3) | 72 (24.3) | 67 (24.1) | 27 (25.2) | 0.002 |
| Eastcost | 36 (18.4) | 57 (18.8) | 58 (19.6) | 56 (20.1) | 29 (27.1) |  |
| Northeastern | 50 (25.5) | 65 (21.4) | 46 (15.5) | 33 (11.9) | 10 (9.3) |  |
| Western | 58 (29.6) | 108 (35.5) | 120 (40.5) | 122 (43.9) | 41 (38.3) |  |
| **Sleep duration and blood pressure** |  |  |  |  |  |
| Sleep duration (hours) | 9.33 (0.94) | 9.13 (0.87) | 9.07 (0.97) | 9.10 (0.90) | 8.49 (0.83) | <0.001 |
| Sleep duration (hours) |  |  |  |  |  |  |
| <9 | 36 (18.4) | 71 (23.4) | 80 (27.0) | 76 (27.3) | 64 (59.8) | <0.001 |
| ≥9 | 160 (81.6) | 233 (76.6) | 216 (73.0) | 202 (72.7) | 43 (40.2) |  |
| SBP (mmHg) | 94.57 (12.57) | 93.92 (11.23) | 98.20 (13.14) | 97.20 (12.10) | 103.11 (13.45) | <0.001 |
| DBP (mmHg) | 62.72 (9.65) | 62.32 (8.08) | 65.70 (8.94) | 63.94 (9.23) | 66.54 (10.15) | <0.001 |
| Elevated BP |  |  |  |  |  |  |
| No | 165 (84.2) | 275 (90.5) | 242 (81.8) | 235 (84.5) | 86 (80.4) | 0.022 |
| Yes | 31 (15.8) | 29 (9.5) | 54 (18.2) | 43 (15.5) | 21 (19.6) |  |

BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; BP: blood pressure

**Table S2** Sample characteristics [(mean (SD) or n (percentage)) in girls over survey year from 2004 to 2015

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **2004 (n=178)** | **2006 (n=252)** | **2009 (n=234)** | **2011 (n=244)** | **2015 (n=102)** | **Time trend (*p*)** |
| **Participants’ personal characteristics** |  |  |  |  |  |
| Age(years) | 8.98 (1.45) | 9.98 (1.86) | 9.98 (1.88) | 9.71 (2.03) | 11.78 (0.82) | <0.001 |
| BMI z score | -0.10 (0.81) | -0.01 (0.97) | -0.05 (0.92) | 0.03 (1.05) | 0.23 (1.31) | 0.345 |
| Waist circumference | 56.06 (6.88) | 57.14 (7.25) | 58.42 (8.40) | 59.52 (11.13) | 65.15 (10.92) | <0.001 |
| Physical exercise frequency per week (times) |  |  |  |  |  |
| <3 | 74 (46.5) | 50 (29.9) | 41 (24.0) | 53 (28.3) | 34 (40.5) | <0.001 |
| 3-7 | 66 (41.5) | 75 (44.9) | 76 (44.4) | 94 (50.3) | 39 (46.1) |  |
| ≥8 | 19 (11.9) | 42 (25.1) | 54 (31.6) | 40 (21.4) | 11 (13.1) |  |
| Screen time per day (hours) |  |  |  |  |  |  |
| <1 | 62 (39.2) | 77 (33.2) | 60 (26.0) | 56 (23.7) | 31 (33.7) | 0.001 |
| 1-2 | 61 (38.6) | 88 (37.9) | 88 (38.1) | 96 (40.7) | 22 (23.9) |  |
| ≥3 | 35 (22.2) | 67 (28.9) | 83 (35.9) | 84 (35.6) | 39 (42.4) |  |
| **Family and community information**  |  |  |  |  |  |
| Parents high BP history |  |  |  |  |  |  |
| No | 160 (97.0) | 227 (97.4) | 197 (93.8) | 195 (95.1) | 80 (94.1) | 0.310 |
| Yes | 5 (3.0) | 6 (2.6) | 13 (6.2) | 10 (4.9) | 5 (5.9) |  |
| Per capital house income (yuan) |  |  |  |  |  |  |
| Tertiles 1  | 86 (48.6) | 109 (44.1) | 82 (35.5) | 65 (27.2) | 20 (19.6) | <0.001 |
| Tertiles 2  | 56 (31.6) | 95 (38.5) | 79 (34.2) | 74 (31.0) | 23 (22.5) |  |
| Tertiles 3 | 35 (19.8) | 43 (17.4) | 70 (30.3) | 100 (41.8) | 59 (57.8) |  |
| Urbanization index |  |  |  |  |  |  |
| Tertiles 1 | 60 (33.7) | 88 (34.9) | 86 (36.8) | 87 (35.7) | 43 (42.2) | 0.790 |
| Tertiles 2 | 63 (35.4) | 90 (35.7) | 80 (34.2) | 74 (30.3) | 30 (29.4) |  |
| Tertiles 3 | 55 (30.9) | 74 (29.4) | 68 (29.1) | 83 (34.0) | 29 (28.4) |  |
| Region |  |  |  |  |  |  |
| Central | 38 (21.3) | 57 (22.6) | 62 (26.5) | 61 (25.0) | 15 (14.7) | <0.001 |
| Eastcost | 25 (14.0) | 38 (15.1) | 40 (17.1) | 50 (20.5) | 30 (29.4) |  |
| Northeastern | 48 (27.0) | 55 (21.8) | 27 (11.5) | 19 (7.8) | 8 (7.8) |  |
| Western | 67 (37.6) | 102 (40.5） | 105 (44.9) | 114 (46.7) | 49 (48.0) |  |
| **Sleep duration and blood pressure** |  |  |  |  |  |  |
| Sleep duration | 9.28 (0.91) | 9.13 (0.93) | 9.20 (0.93) | 9.16 (0.89) | 8.68 (1.03) | <0.001 |
| Sleep duration |  |  |  |  |  |  |
| <9h | 35 (19.7) | 65 (25.8) | 55 (23.5) | 52 (21.3) | 53 (52.0) | <0.001 |
| ≥9h | 143 (80.3) | 187 (74.2) | 179 (76.5) | 192 (78.7) | 49 (48.0) |  |
| SBP (mmHg) | 92.28 (12.10) | 93.65 (12.95) | 96.61 (12.63) | 95.54 (11.11) | 101.32 (11.60) | <0.001 |
| DBP (mmHg) | 60.76 (9.60) | 61.71 (8.94) | 64.90 (9.46) | 62.19 (8.56) | 65.73 (8.33) | <0.001 |
| Elevated BP |  |  |  |  |  |  |
| No | 157 (88.2) | 228 (90.5) | 193 (82.5) | 221 (90.6) | 91 (89.2) | 0.041 |
| Yes | 21 (11.8) | 24 (9.5) | 41 (17.5) | 23 (9.4) | 11 (10.8) |  |

BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; BP: blood pressure



**Figure S1** Sampling flowchart and participants enrollment

**Table S3** The association of sleep duration with BP in 2004-2015.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **SBP** | **P for interaction** | **DBP** | **P for interaction** | **Elevated BP** | **P for interaction** |
|  | **β (95%CI)** |  | **β (95%CI)** |  | **OR (95%CI)** |  |
| **Crude** |  |  |  |  |  |  |
| continuous | -2.052(-2.619, -1.485) |  | -1.159(-1.561, -0.757) |  | 0.814 (0.708, 0.935) |  |
| <9h | **3.757 (2.582, 4.931)** |  | **1.964 (1.088, 2.840)** |  | **1.396 (1.066, 1.829)** |  |
| ≥9h | Reference |  | Reference |  | Reference |  |
| **Adjusted model1** |  |  |  |  |  |  |
| continuous | **-0.801(-1.416, -0.185)** |  | -0.388 (-0.823, 0.046) |  | **0.823 (0.704, 0.962)** |  |
| <9h | 1.098 (-0.165, 2.362) |  | 0.405 (-0.515, 1.324) |  | **1.361 (1.007, 1.841)** |  |
| ≥9h | Reference |  | Reference |  | Reference |  |
| **Adjusted model2** |  |  |  |  |  |  |
| continuous | -0.678 (-1.457, 0.101) |  | -0.210 (-0.748, 0.327) |  | 0.891 (0.731, 1.086) |  |
| <9h | 1.458 (-0.015, 2.931) |  | 0.641 (-0.433, 1.714) |  | 1.200 (0.837, 1.722) |  |
| ≥9h | Reference |  | Reference |  | Reference |  |
| **Interaction term** |  |  |  |  |  |  |
| Gender |  | 0.746 |  | **0.011** |  | 0.375 |
| BMI z score  |  | 0.828 |  | 0.654 |  | 0.328 |
| WC |  | 0.290 |  | 0.905 |  | 0.808 |
| Physical activities |  | 0.058 |  | 0.454 |  | 0.568 |

OR, odds ratios; CI, confidence interval

Model 1 adjusted for age, gender and parents hypertension history

Model 2 additionally adjusted for survey time, waist circumference, BMI z score, urbanization, per capita household income, region, frequency of physical activities per week, screen time per day.

|  |
| --- |
| **Table S4** The association of sleep duration with SBP, DBP, and elevated BP stratified by gender in 2004-2011. |
|  | **SBP** | **DBP** | **Elevated BP** |
|  | **β (95%CI)** | **β (95%CI)** | **OR (95%CI)** |
| **Boy**  | N=976 |  |  |
| Crude model |  |  |  |
| Continuous  | **-1.698 (-2.565, -0.831) \*\*** | -0.595 (-1.198, 0.008) | 0.845 (0.702, 1.016) |
| <9h | **2.415 (0.683, 4.147) \*\*** | 0.447 (-0.842, 1.736) | 1.182 (0.803, 1.738) |
| ≥9h | Reference | Reference | Reference |
| Adjusted model1 |  |  |  |
| Continuous | -0.701 (-1.639, 0.237) | 0.119 (-0.510, 0.748) | 0.843 (0.682, 1.041) |
| <9h | 0.571 (-1.280, 2.423) | -0.780 (-2.067, 0.507) | 1.181 (0.771, 1.808) |
| ≥9h | Reference | Reference | Reference |
| Adjusted model2 |  |  |  |
| Continuous | -0.650 (-1.830, 0.530) | 0.554 (-0.236, 1.344) | 0.940 (0.724, 1.221) |
| <9h | 0.350 (-1.868, 2.567) | -1.367 (-2.859, 0.124) | 1.007 (0.595, 1.705) |
| ≥9h | Reference | Reference | Reference |
| **Girl**  | n=815 |  |  |
| Crude model |  |  |  |
| Continuous | **-2.016 (-2.933, -1.098) \*\*\*** | **-1.857 (-2.505, -1.210) \*\*\*** | **0.676 (0.523, 0.874) \*\*** |
| <9h | **3.745 (1.663, 5.828) \*\*\*** | **3.317 (1.732, 4.901) \*\*\*** | **1.994 (1.234, 3.223) \*\*** |
| ≥9h | Reference | Reference | Reference |
| Adjusted model1 |  |  |  |
| Continuous | **-1.226 (-2.162, -0.291) \*\*** | **-1.562 (-2.241, -0.883) \*\*\*** | **0.675 (0.507, 0.898) \*\*** |
| <9h | 1.832 (-0.292, 3.956) | **2.543 (0.909, 4.177) \*\*** | **2.017 (1.199, 3.394) \*\*** |
| ≥9h | Reference | Reference | Reference |
| Adjusted model2 |  |  |  |
| Continuous | -0.831 (-1.970, 0.301) | **-1.336 (-2.145, -0.527) \*\*** | 0.727 (0.501, 1.055)  |
| <9h | 1.694 (-0.725, 4.113) | **2.193 (0.425, 3.962) \*** | **1.909 (1.024, 3.556) \*** |
| ≥9h | Reference | Reference | Reference |
| \* P<0.05, \*\* P<0.01, \* P<0.001.OR, odds ratios; CI, confidence intervalModel 1 adjusted for age, parents’ hypertension historyModel 2 additionally adjusted for survey time, BMI z score, waist circumference, urbanization, per capita household income, region, frequency of physical activities per week, screen time per day. |