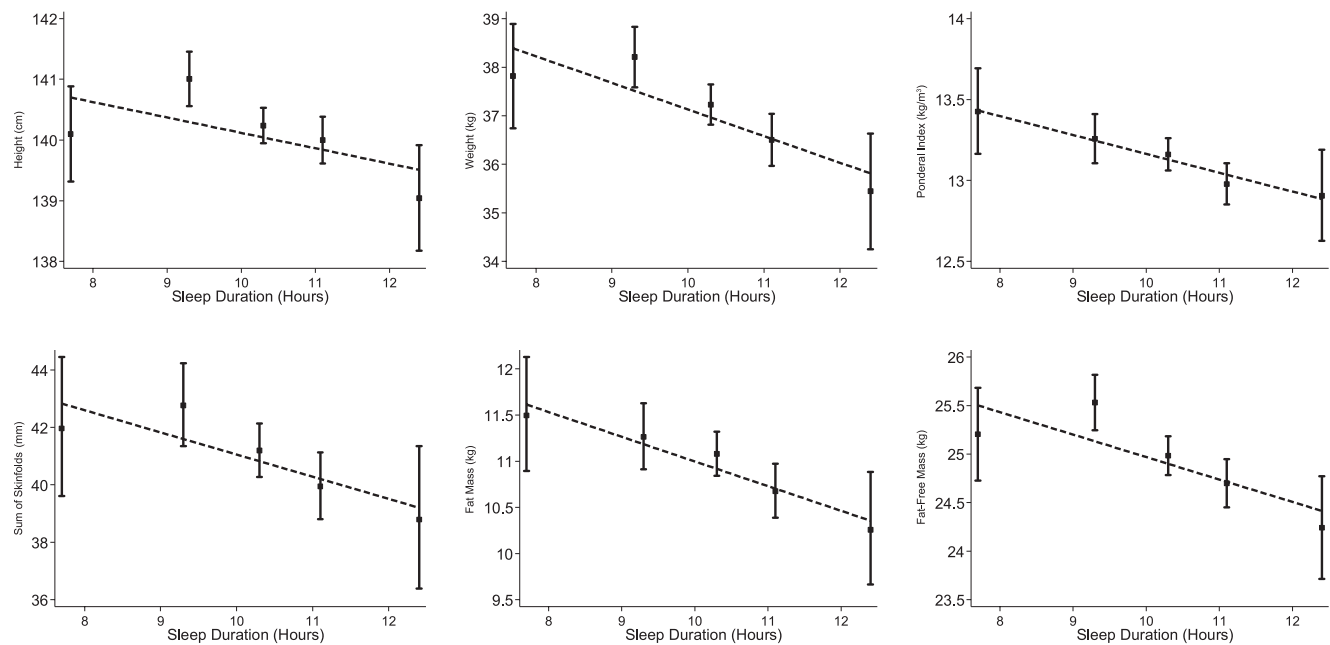


Supplemental Information



SUPPLEMENTAL FIGURE 3

Adjusted means for body size and adiposity markers by sleep duration (adjusted for sex, age quartile, month, ethnicity, social position, observer [physical measures only], and random effect for school).

SUPPLEMENTAL TABLE 4 Adjusted Mean Values of Body Size, Body Fatness, T2D and Cardiovascular Risk Markers, and Difference in Marker Per Hour Increase in Sleep in Boys and Girls Separately (Analysis Stratified by Sex)

	Hours of Sleep on a School Night (95% CI)				Difference per Hour of Sleep (95% CI) ^a	P ^b
	<9 h	9–9.9 h	10–10.9 h	11–11.9 h		
BOYS						
Boys body size						
Height (cm)	139.5 (138.6 to 140.5)	140.6 (140.0 to 141.2)	139.9 (139.4 to 140.3)	139.9 (139.4 to 140.5)	138.8 (137.6 to 140.0)	.151
Weight (kg)	37.1 (35.8 to 38.3)	37.6 (36.8 to 38.5)	36.5 (36.0 to 37.1)	36.3 (35.5 to 37.0)	34.6 (33.0 to 36.3)	.004
Ponderal index (kg/m ³) ^c	13.3 (13.0 to 13.6)	13.2 (13.0 to 13.4)	13.0 (12.9 to 13.2)	12.9 (12.7 to 13.1)	12.7 (12.3 to 13.1)	.001
Sum skinfolds (mm) ^c	37.1 (34.4 to 40.0)	38.9 (37.0 to 40.8)	36.5 (35.3 to 37.7)	36.0 (34.4 to 37.6)	33.9 (30.8 to 37.4)	.024
Fat mass (kg) ^c	10.5 (9.8 to 11.3)	10.5 (10.1 to 11.0)	10.1 (9.8 to 10.4)	10.1 (9.7 to 10.5)	9.5 (8.7 to 10.3)	.014
Fat-free mass (kg)	25.4 (24.8 to 25.9)	25.8 (25.4 to 26.1)	25.2 (25.0 to 25.5)	25.0 (24.7 to 25.4)	24.4 (23.7 to 25.1)	.002
Fat mass index (kg/m ²)	2.15 (2.03 to 2.27)	2.10 (2.02 to 2.18)	2.06 (2.00 to 2.11)	2.04 (1.97 to 2.11)	1.97 (1.81 to 2.12)	.027
Fat-free mass index (kg/m ³)	9.31 (9.18 to 9.43)	9.22 (9.14 to 9.30)	9.18 (9.13 to 9.24)	9.10 (9.02 to 9.18)	9.08 (8.92 to 9.23)	.001
Cardiometabolic markers						
Insulin (mU/L) ^{c,d}	6.87 (6.25 to 7.54)	6.66 (6.26 to 7.09)	6.52 (6.22 to 6.83)	6.45 (6.08 to 6.85)	5.74 (5.10 to 6.46)	.043
Insulin resistance ^{c,d}	0.86 (0.79 to 0.95)	0.84 (0.79 to 0.89)	0.82 (0.79 to 0.86)	0.82 (0.77 to 0.87)	0.73 (0.65 to 0.82)	.065
Glucose (mmol/L) ^c	4.59 (4.54 to 4.65)	4.57 (4.53 to 4.60)	4.55 (4.53 to 4.58)	4.54 (4.51 to 4.57)	4.57 (4.51 to 4.64)	.037
HbA1c (%)	5.26 (5.21 to 5.31)	5.26 (5.23 to 5.29)	5.25 (5.23 to 5.27)	5.24 (5.21 to 5.27)	5.24 (5.18 to 5.30)	.235
HbA1c (mmol/mol)	34 (33 to 36)	34 (33 to 34)	34 (33 to 34)	34 (33 to 34)	34 (33 to 34)	.235
Leptin (ng/mL) ^{c,d}	6.8 (5.9 to 7.9)	7.7 (7.1 to 8.5)	7.3 (6.9 to 7.8)	6.9 (6.4 to 7.5)	6.3 (5.2 to 7.5)	.148
Total cholesterol (mmol/L)	4.6 (4.5 to 4.8)	4.6 (4.5 to 4.7)	4.6 (4.5 to 4.6)	4.6 (4.6 to 4.7)	4.5 (4.4 to 4.7)	.170
LDL cholesterol (mmol/L)	2.7 (2.6 to 2.8)	2.7 (2.6 to 2.8)	2.7 (2.6 to 2.7)	2.7 (2.6 to 2.7)	2.7 (2.6 to 2.8)	.166
HDL cholesterol (mmol/L)	1.6 (1.5 to 1.6)	1.5 (1.5 to 1.6)	1.6 (1.5 to 1.6)	1.6 (1.6 to 1.6)	1.5 (1.5 to 1.6)	.686
Triglyceride (mmol/L) ^c	0.7 (0.7 to 0.8)	0.8 (0.7 to 0.8)	0.8 (0.7 to 0.8)	0.8 (0.7 to 0.8)	0.7 (0.7 to 0.8)	.425
Urate (mmol/L) ^c	0.2 (0.2 to 0.2)	0.2 (0.2 to 0.2)	0.2 (0.2 to 0.2)	0.2 (0.2 to 0.2)	0.2 (0.2 to 0.2)	.862
Systolic BP (mm Hg)	104.8 (103.3 to 106.4)	105.7 (104.7 to 106.7)	105.5 (104.8 to 106.2)	104.5 (103.6 to 105.5)	104.6 (102.7 to 106.5)	.477
Diastolic BP (mm Hg)	62.9 (61.5 to 64.3)	63.5 (62.6 to 64.5)	62.9 (62.2 to 63.6)	62.1 (61.2 to 63.0)	62.6 (60.8 to 64.3)	.735
GIRLS						
Girls body size						
Height (cm)	140.9 (139.5 to 142.2)	141.4 (140.7 to 142.1)	140.6 (140.1 to 141.0)	140.1 (139.5 to 140.6)	139.2 (137.9 to 140.4)	.004
Weight (kg)	38.8 (36.9 to 40.6)	38.7 (37.8 to 39.7)	37.8 (37.2 to 38.4)	36.8 (36.0 to 37.5)	36.1 (34.4 to 37.8)	.003
Ponderal index (kg/m ³) ^c	13.5 (13.1 to 14.0)	13.3 (13.1 to 13.5)	13.3 (13.1 to 13.4)	13.0 (12.9 to 13.2)	13.1 (12.7 to 13.5)	.122
Sum skinfolds (mm) ^c	47.7 (43.5 to 52.2)	46.6 (44.6 to 48.8)	46.0 (44.7 to 47.3)	44.0 (42.4 to 45.6)	44.0 (40.4 to 47.8)	.128
Fat mass (kg) ^c	12.6 (11.6 to 13.7)	12.0 (11.5 to 12.6)	12.0 (11.7 to 12.4)	11.3 (10.9 to 11.7)	11.1 (10.2 to 12.0)	.023
Fat-free mass (kg)	25.11 (24.28 to 25.93)	25.28 (24.87 to 25.69)	24.68 (24.42 to 24.95)	24.33 (24.00 to 24.66)	24.00 (23.23 to 24.76)	.001
Fat mass index (kg/m ²)	2.43 (2.26 to 2.60)	2.32 (2.24 to 2.41)	2.36 (2.30 to 2.41)	2.26 (2.19 to 2.33)	2.30 (2.14 to 2.46)	.406
Fat-free mass index (kg/m ³)	8.90 (8.72 to 9.07)	8.89 (8.80 to 8.98)	8.83 (8.76 to 8.89)	8.80 (8.73 to 8.88)	8.86 (8.69 to 9.02)	.302
Cardiometabolic markers						
Insulin (mU/L) ^{c,d}	8.59 (7.60 to 9.72)	8.46 (7.94 to 9.02)	8.33 (7.99 to 8.69)	7.78 (7.39 to 8.19)	7.06 (6.29 to 7.93)	.002
Insulin resistance ^{c,d}	1.08 (0.96 to 1.22)	1.07 (1.00 to 1.14)	1.04 (1.00 to 1.09)	0.98 (0.93 to 1.03)	0.89 (0.79 to 1.00)	.001
Glucose (mmol/L) ^c	4.50 (4.43 to 4.57)	4.49 (4.46 to 4.53)	4.48 (4.45 to 4.50)	4.45 (4.42 to 4.48)	4.48 (4.42 to 4.54)	.183

TABLE 4. Continued

	Hours of Sleep on a School Night (95% CI)					P ^b
	<9 h	9–9.9 h	10–10.9 h	11–11.9 h	≥12 h	
HbA1c (%)	5.3 (5.2 to 5.4)	5.3 (5.2 to 5.3)	5.2 (5.2 to 5.3)	5.2 (5.2 to 5.3)	5.3 (5.2 to 5.3)	.261
HbA1c (mmol/mol)	34 (33 to 36)	34 (33 to 34)	34 (33 to 34)	34 (33 to 34)	34 (33 to 34)	.261
Leptin (ng/mL) ^{c,d}	12.6 (10.6 to 14.9)	11.9 (10.9 to 13.0)	12.0 (11.3 to 12.8)	10.6 (9.8 to 11.4)	10.0 (8.5 to 11.8)	.041
Total cholesterol (mmol/L)	4.5 (4.3 to 4.6)	4.5 (4.5 to 4.6)	4.5 (4.5 to 4.6)	4.5 (4.5 to 4.6)	4.5 (4.4 to 4.7)	.936
LDL cholesterol (mmol/L)	2.6 (2.5 to 2.8)	2.7 (2.6 to 2.7)	2.7 (2.6 to 2.7)	2.7 (2.6 to 2.7)	2.7 (2.6 to 2.8)	.532
HDL cholesterol (mmol/L)	1.5 (1.4 to 1.5)	1.5 (1.5 to 1.5)	1.5 (1.5 to 1.5)	1.5 (1.4 to 1.5)	1.5 (1.4 to 1.5)	.348
Triglyceride (mmol/L) ^c	0.9 (0.8 to 0.9)	0.8 (0.8 to 0.9)	0.9 (0.8 to 0.9)	0.8 (0.8 to 0.9)	0.8 (0.8 to 0.9)	.645
Urate (mmol/L) ^c	0.2 (0.2 to 0.2)	0.2 (0.2 to 0.2)	0.2 (0.2 to 0.2)	0.2 (0.2 to 0.2)	0.2 (0.2 to 0.2)	.449
Systolic BP (mm Hg)	103.0 (101.0 to 105.1)	104.4 (103.4 to 105.4)	104.3 (103.6 to 105.0)	104.3 (103.5 to 105.1)	104.1 (102.2 to 106.0)	.194
Diastolic BP (mm Hg)	62.7 (60.9 to 64.5)	63.4 (62.4 to 64.3)	63.0 (62.4 to 63.6)	63.3 (62.5 to 64.0)	62.4 (60.7 to 64.1)	.628

Adjusted means of outcome variables by sleep category from multilevel model adjusted for sex, age, quartile, month, ethnicity, social position, observer (physical measures only), and random effect for school. HDL, high-density lipoprotein; LDL, low-density lipoprotein; —, no data.

^aRegression coefficients from multilevel model for continuous association with hours of sleep are adjusted for sex, age, quartile, month, ethnicity, social position, observer (physical measures only), and random effect for school. For log-transformed outcomes, these represent percent differences.

^bP values for regression coefficients from the multilevel model, assuming a linear continuous association with sleep duration.

^cGeometric means for log-transformed variables.

^dInsulin and insulin resistance data are missing for 76 children; leptin data are missing for 97 children.