

Supplementary table 1. Multiple linear regression analyses of maximal oxygen consumption (VO<sub>2max</sub>, ml/kg/min), systolic blood pressure (SBP, mm Hg), diastolic blood pressure (DBP, mm Hg), total cholesterol/ high-density lipoprotein cholesterol (TC/HDL, mg/dL) and low-density lipoprotein cholesterol (LDL, mg/dL) with anthropometric and body composition indices.

	Boys				Girls			
	Adjusted R <sup>2</sup>	β	SE	P	Adjusted R <sup>2</sup>	β	SE	P
<i>Independent variables</i>	<b>VO<sub>2 max</sub> (n=2146)</b>							
Neck circumference	0.231	-1.173	0.062	<b>&lt;0.001</b>	0.018	-0.467	0.081	<b>&lt;0.001</b>
Body mass index	0.253	-0.910	0.047	<b>&lt;0.001</b>	0.044	-0.497	0.044	<b>&lt;0.001</b>
Waist circumference	0.231	-0.379	0.022	<b>&lt;0.001</b>	0.037	-0.197	0.019	<b>&lt;0.001</b>
Waist-to-height ratio	0.113	-61.143	3.823	<b>&lt;0.001</b>	0.039	-31.074	3.138	<b>&lt;0.001</b>
Body fat percentage	0.285	-0.339	0.016	<b>&lt;0.001</b>	0.066	-0.266	0.018	<b>&lt;0.001</b>
Fat mass index	0.111	-0.684	0.036	<b>&lt;0.001</b>	0.058	-0.492	0.039	<b>&lt;0.001</b>
	<b>SBP (n=2191)</b>							
Neck circumference	0.353	2.526	0.155	<b>&lt;0.001</b>	0.353	2.526	0.155	<b>&lt;0.001</b>
Body mass index	0.239	1.237	0.100	<b>&lt;0.001</b>	0.168	1.059	0.096	<b>&lt;0.001</b>
Waist circumference	0.281	0.552	0.042	<b>&lt;0.001</b>	0.200	0.515	0.042	<b>&lt;0.001</b>
Waist-to-height ratio	0.053	66.232	7.317	<b>&lt;0.001</b>	0.042	57.874	6.994	<b>&lt;0.001</b>
Body fat percentage	0.047	0.279	0.033	<b>&lt;0.001</b>	0.127	0.436	0.042	<b>&lt;0.001</b>
Fat mass index	0.033	0.531	0.073	<b>&lt;0.001</b>	0.026	0.603	0.090	<b>&lt;0.001</b>
	<b>DBP (n=2191)</b>							
Neck circumference	0.113	1.195	0.111	<b>&lt;0.001</b>	0.089	1.216	0.133	<b>&lt;0.001</b>
Body mass index	0.132	0.793	0.061	<b>&lt;0.001</b>	0.095	0.741	0.071	<b>&lt;0.001</b>
Waist circumference	0.126	0.293	0.023	<b>&lt;0.001</b>	0.105	0.328	0.030	<b>&lt;0.001</b>
Waist-to-height ratio	0.058	46.204	4.984	<b>&lt;0.001</b>	0.035	47.497	5.554	<b>&lt;0.001</b>
Body fat percentage	0.065	0.198	0.022	<b>&lt;0.001</b>	0.092	0.323	0.035	<b>&lt;0.001</b>
Fat mass index	0.061	0.434	0.049	<b>&lt;0.001</b>	0.047	0.588	0.072	<b>&lt;0.001</b>
	<b>Total cholesterol/HDL cholesterol (n=514)</b>							
Neck circumference	0.098	0.098	0.015	<b>&lt;0.001</b>	0.048	0.073	0.019	<b>&lt;0.001</b>
Body mass index	0.148	1.715	0.183	<b>&lt;0.001</b>	0.045	0.003	0.010	<b>&lt;0.001</b>
Waist circumference	0.106	0.022	0.003	<b>&lt;0.001</b>	0.030	0.027	0.005	<b>&lt;0.001</b>
Waist-to-height ratio	0.222	5.999	0.617	<b>0.001</b>	0.126	4.562	0.688	<b>&lt;0.001</b>
Body fat percentage	0.226	0.025	0.003	<b>&lt;0.001</b>	0.081	0.032	0.005	<b>&lt;0.001</b>
Fat mass index	0.143	0.062	0.009	<b>&lt;0.001</b>	0.143	0.062	0.009	<b>&lt;0.001</b>
	<b>LDL cholesterol (n=513)</b>							
Neck circumference	0.013	1.377	0.663	<b>0.039</b>	0.007	-0.844	0.516	0.103
Body mass index	0.001	0.445	0.407	0.275	<0.001	-0.400	0.390	0.306
Waist circumference	<0.001	0.094	0.152	0.535	0.002	-0.205	0.169	0.225
Waist-to-height ratio	0.002	39.593	30.87	0.201	<0.001	25.630	31.298	0.414
Body fat percentage	0.002	0.186	0.147	0.209	<0.001	-0.046	0.187	0.806
Fat mass index	0.002	0.354	0.286	0.216	0.004	0.560	0.400	0.162

Significant results are in **bold** (p < 0.05).

β indicates estimated unstandardized regression coefficient; SE, standard error.

All analyses were controlled for age and Tanner stage.

Supplementary table 2. Multiple linear regression analyses of triglycerides (mg/dL), of insulin resistance (HOMA score), C-reactive protein (CRP, mg/dL), C3-protein (C-3, mg/dL) and C4-protein (C-4, mg/dL) with anthropometric and body composition indices.

	Boys				Girls			
	Adjusted	$\beta$	SE	P	Adjusted R <sup>2</sup>	$\beta$	SE	P
<i>Independent variables</i>								
<b>Triglycerides (n=514)</b>								
Neck circumference	0.038	1.669	0.490	<b>&lt;0.001</b>	0.042	1.799	0.553	<b>&lt;0.001</b>
Body mass index	0.033	1.669	0.524	<b>&lt;0.001</b>	0.037	1.262	0.416	<b>&lt;0.001</b>
Waist circumference	0.053	0.748	0.193	<b>&lt;0.001</b>	0.042	0.590	0.181	<b>0.001</b>
Waist-to-height ratio	0.019	97.477	41.998	<b>0.003</b>	<0.001	0.108	1.690	0.108
Body fat percentage	0.015	0.382	0.190	<b>0.045</b>	0.036	0.637	0.200	<b>0.002</b>
Fat mass index	<0.001	0.802	0.418	0.056	0.01	1.037	0.047	<b>0.021</b>
<b>HOMA (n=342)</b>								
Neck circumference	0.169	0.256	0.043	<b>&lt;0.001</b>	0.073	0.604	0.160	<b>&lt;0.001</b>
Body mass index	0.117	0.151	0.043	<b>0.001</b>	0.029	0.124	0.050	<b>0.015</b>
Waist circumference	0.162	0.066	0.019	<b>&lt;0.001</b>	0.009	0.037	0.024	0.119
Waist-to-height ratio	0.032	8.029	3.110	<b>0.011</b>	0.003	-4.321	3.612	0.233
Body fat percentage	0.044	0.043	0.014	<b>0.003</b>	0.015	0.045	0.024	0.060
Fat mass index	0.021	0.069	0.033	<b>0.039</b>	<0.001	0.009	0.047	0.847
<b>CRP (n=315)</b>								
Neck circumference	0.055	0.351	0.094	<b>&lt;0.001</b>	<0.001	-0.092	0.094	0.328
Body mass index	0.028	0.291	0.106	<b>0.007</b>	0.025	0.221	0.069	<b>0.002</b>
Waist circumference	0.033	0.120	0.040	<b>0.003</b>	0.002	-0.034	0.030	0.257
Waist-to-height ratio	0.015	8.941	4.762	<b>0.047</b>	<0.001	5.088	5.291	0.338
Body fat percentage	0.059	29.624	7.558	<b>&lt;0.001</b>	0.060	15.668	4.388	<b>&lt;0.001</b>
Fat mass index	0.065	0.226	0.059	<b>&lt;0.001</b>	0.080	0.236	0.057	<b>&lt;0.001</b>
<b>C-3 (n=514)</b>								
Neck circumference	0.035	3.164	0.728	<b>&lt;0.001</b>	0.026	1.630	0.557	<b>0.004</b>
Body mass index	0.088	2.364	0.413	<b>&lt;0.001</b>	0.050	1.644	0.412	<b>&lt;0.001</b>
Waist circumference	0.063	1.133	0.220	<b>&lt;0.001</b>	0.039	0.648	0.191	<b>0.001</b>
Waist-to-height ratio	0.118	206.454	30.784	<b>&lt;0.001</b>	0.130	193.054	30.910	<b>&lt;0.001</b>
Body fat percentage	0.140	0.915	0.129	<b>&lt;0.001</b>	0.089	1.024	0.192	<b>&lt;0.001</b>
Fat mass index	0.118	1,884	0.285	<b>&lt;0.001</b>	0.158	2.784	0.382	<b>&lt;0.001</b>
<b>C-4 (n=514)</b>								
Neck circumference	0.037	0.478	0.129	<b>&lt;0.001</b>	0.024	0.539	0.189	<b>0.005</b>
Body mass index	0.061	0.671	0.141	<b>&lt;0.001</b>	0.063	0.619	0.139	<b>0.002</b>
Waist circumference	0.041	0.241	0.055	<b>&lt;0.001</b>	0.031	0.271	0.065	<b>&lt;0.001</b>
Waist-to-height ratio	0.067	53.401	10.570	<b>&lt;0.001</b>	0.99	56.768	10.655	<b>&lt;0.001</b>
Body fat percentage	0.118	0.277	0.043	<b>&lt;0.001</b>	0.99	0.36	0.065	<b>&lt;0.001</b>
Fat mass index	0.098	0.574	0.094	<b>&lt;0.001</b>	0.145	0.869	0.132	<b>&lt;0.001</b>

Significant results are in **bold** ( $p < 0.05$ ).

$\beta$  indicates estimated unstandardized regression coefficient; SE, standard error.

All analyses were controlled for age and Tanner stage.

Supplementary table 3. Multiple linear regression analyses of interleukin 6 (IL-6, pg/mJ) leptin (ng/mL), adiponectin (µg/mL), and visfatin (ng/mL) with anthropometric and body composition indices.

	Boys				Girls			
	Adjusted	β	SE	P	Adjusted	β	SE	P
<i>Independent variables</i>								
<b>IL-6 (n=502)</b>								
Neck circumference	<0.001	-0.200	0.527	0.705	0.003	-1.552	1.139	0.174
Body mass index	<0.001	-0.106	0.590	0.857	<0.001	-0.753	1.001	0.453
Waist circumference	<0.001	-0.030	0.225	0.893	0.001	-0.425	0.391	0.279
Waist-to-height ratio	0.028	139.795	43.662	<b>0.002</b>	0.001	77.657	65.893	0.240
Body fat percentage	<0.001	0.255	0.183	0.164	<0.001	0.325	0.448	0.469
Fat mass index	0.012	0.739	0.384	<b>0.048</b>	0.007	1.402	0.831	0.093
<b>Leptin (n=499)</b>								
Neck circumference	0.060	713.142	155.007	<b>&lt;0.001</b>	0.179	1927.779	252.179	<b>&lt;0.001</b>
Body mass index	0.165	1158.997	89.388	<b>&lt;0.001</b>	0.374	1747.644	139.514	<b>&lt;0.001</b>
Waist circumference	0.089	495.536	40.142	<b>&lt;0.001</b>	0.269	554.476	54.713	<b>&lt;0.001</b>
Waist-to-height ratio	0.286	66804.453	5902.475	<b>&lt;0.001</b>	0.208	84803.472	9319.467	<b>&lt;0.001</b>
Body fat percentage	0.242	300.358	26.911	<b>&lt;0.001</b>	0.368	668.546	52.889	<b>&lt;0.001</b>
Fat mass index	0.289	612.946	56.721	<b>&lt;0.001</b>	0.261	1183.717	113.155	<b>&lt;0.001</b>
<b>Adiponectin (n=506)</b>								
Neck circumference	0.049	-0.357	0.084	<b>&lt;0.001</b>	0.036	-0.463	0.138	<b>&lt;0.001</b>
Body mass index	0.051	-0.282	0.110	<b>0.010</b>	0.042	-0.371	0.102	<b>&lt;0.001</b>
Waist circumference	0.066	-0.175	0.036	<b>&lt;0.001</b>	0.038	-0.162	0.047	<b>0.001</b>
Waist-to-height ratio	0.030	-23.791	7.015	<b>0.001</b>	0.036	-26.967	7.972	<b>0.001</b>
Body fat percentage	0.016	-0.045	0.032	<b>0.016</b>	0.047	-0.186	0.049	<b>&lt;0.001</b>
Fat mass index	0.001	-0.100	0.0067	0.135	0.032	-0.319	0.101	<b>0.002</b>
<b>TNF- α (n=478)</b>								
Neck circumference	<0.001	1.058	1.182	0.539	0.016	-2.052	3.976	0.413
Body mass index	0.001	2.915	1.199	0.628	0.001	-5.176	1.887	0.459
Waist circumference	0.003	0.366	0.526	0.541	0.003	-0.539	0.968	0.409
Waist-to-height ratio	<0.001	11.347	7.602	0.881	<0.001	8.959	6.398	0.926
Body fat percentage	<0.001	-0.104	0.101	0.743	0.002	-0.466	4.619	0.460
Fat mass index	0.002	-0.290	0.632	0.662	0.001	0.114	1.840	0.924
<b>Visfatin (n=324)</b>								
Neck circumference	0.107	-0.100	0.025	<b>&lt;0.001</b>	0.012	-0.046	0.030	0.124
Body mass index	0.026	-0.005	0.033	0.876	<0.001	-0.019	0.024	0.421
Waist circumference	0.093	-0.017	0.015	0.264	<0.001	-0.005	0.011	0.627
Waist-to-height ratio	0.010	1.263	2.136	0.555	0.012	2.689	1.736	0.124
Body fat percentage	<0.001	0.006	0.011	0.606	<0.001	-0.004	0.011	0.722
Fat mass index	0.057	0.025	0.022	0.273	0.002	0.022	0.024	0.278

Significant results are in **bold** ( $p < 0.05$ ).

β indicates estimated unstandardized regression coefficient; SE, standard error.

All analyses were controlled for age and Tanner stage.

Supplementary table 4. Multiple linear regression analyses of cardiovascular risk score with anthropometric and body composition indices.

	Boys				Girls			
	Adjusted	$\beta$	SE	P	Adjusted	$\beta$	SE	P
<i>Independent variables</i>	<b>Clustered CVD risk factor (n=315)</b>							
Neck circumference	0.130	0.287	0.103	<b>&lt;0.001</b>	0.207	0.834	0.248	<b>&lt;0.001</b>
Body mass index	0.095	0.201	0.104	<b>&lt;0.001</b>	0.111	0.432	0.095	<b>&lt;0.001</b>
Waist circumference	0.125	0.175	0.027	<b>&lt;0.001</b>	0.073	0.141	0.028	<b>&lt;0.001</b>
Waist-to-height ratio	0.175	34.634	7.176	<b>&lt;0.001</b>	0.174	21.415	6.394	<b>&lt;0.001</b>
Body fat percentage	0.113	0.119	0.033	<b>&lt;0.001</b>	0.143	0.194	0.042	<b>&lt;0.001</b>
Fat mass index	0.109	0.268	0.076	<b>&lt;0.001</b>	0.290	0.419	0.088	<b>&lt;0.001</b>

Significant results are in **bold** ( $p < 0.05$ ).

$\beta$  indicates estimated unstandardized regression coefficient; SE, standard error.

All analyses were controlled for age and Tanner stage.