Article:
Lichtenauer, M., Wheatley, S.D., Martyn-St James, M. orcid.org/0000-0002-4679-7831 et al. (13 more authors) (2018) Efficacy of anthropometric measures for identifying cardiovascular disease risk in adolescents: review and meta-analysis. Minerva Pediatrica, 70 (4). pp. 371-382. ISSN 0026-4946

10.23736/S0026-4946.18.05175-7

Figure 2

(a)

systolic blood pressure (in mmHg)

Study or Subgroup	Not overweight (UW/NW) Mean	SD	Total	Overweight/Obese (OW/Ob) Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Male participants								
Burke 2004 M	115	10	607	115	11	73	7.3%	0.00 [-2.65, 2.65]
Chiolero 2006 M	109	13	3290	118	14	504	8.2%	-9.00 [-10.30, -7.70]
Cobayashi 2010 M	105	9	66	118	11	75	6.8%	-13.00 [-16.30, -9.70]
Duncan 2011 M	116	17	254	126	12	113	7.0%	-10.00 [-13.04, -6.96]
Kollias 2009 M	122	10	164	127	12	115	7.3%	-5.00 [-7.67, -2.33]
Musso 2011 M	109	14	400	119	16	126	7.0%	-10.00 [-13.11, -6.89]
Subtotal (95% CI)			**4781**			**1006**	**43.6%**	**-7.78 [-11.13, -4.42]**
Heterogeneity: Tau² = 15.64; Chi² = 54.24, df = 5 (P < 0.00001); I² = 91%								
Test for overall effect: Z = 4.54 (P < 0.00001)								
Female participants								
Burke 2004 F	115	10	522	114	10	78	7.5%	1.00 [-1.38, 3.38]
Chiolero 2006 F	106	10	3198	114	11	812	8.4%	-8.00 [-8.83, -7.17]
Cobayashi 2010 F	101	12	80	113	13	96	6.5%	-12.00 [-15.70, -8.30]
Duncan 2011 F	114	15	198	121	14	57	6.0%	-7.00 [-11.19, -2.81]
Kollias 2009 F	117	10	207	120	11	72	7.1%	-3.00 [-5.88, -0.12]
Musso 2011 F	106	13	360	116	12	78	7.1%	-10.00 [-12.98, -7.02]
Subtotal (95% CI)			**4565**			**1193**	**42.7%**	**-6.41 [-10.01, -2.81]**
Heterogeneity: Tau² = 18.01; Chi² = 67.16, df = 5 (P < 0.00001); I² = 93%								
Test for overall effect: Z = 3.49 (P = 0.0005)								
Male and female combined								
Klein-Platat 2005	110	12	60	114	12	60	6.0%	-4.00 [-8.29, 0.29]
Lurbe 2006	101	10	180	107	10	165	7.7%	-6.00 [-8.11, -3.89]
Subtotal (95% CI)			**240**			**225**	**13.7%**	**-5.61 [-7.51, -3.71]**
Heterogeneity: Tau² = 0.00; Chi² = 0.67, df = 1 (P = 0.41); I² = 0%								
Test for overall effect: Z = 5.80 (P < 0.00001)								
Total (95% CI)			**9586**			**2424**	**100.0%**	**-6.81 [-8.71, -4.90]**
Heterogeneity: Tau² = 11.10; Chi² = 127.10, df = 13 (P < 0.00001); I² = 90%								
Test for overall effect: Z = 6.99 (P < 0.00001)								
Test for subgroup differences: Chi² = 1.23, df = 2 (P = 0.54), I² = 0%								

Mean Difference IV, Random, 95% CI

-10 -5 0 5 10

Lower in UW/NW group Lower in OW/Ob group

(b)

diastolic blood pressure (in mmHg)

Study or Subgroup	Not overweight (UW/NW) Mean	SD	Total	Overweight/Obese (OW/Ob) Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Male participants								
Burke 2004 M	67	7	607	65	6	73	7.7%	2.00 [0.52, 3.48]
Chiolero 2006 M	66	9	3290	72	9	504	7.9%	-6.00 [-6.84, -5.16]
Cobayashi 2010 M	67	8	66	71	9	75	6.8%	-4.00 [-6.81, -1.19]
Duncan 2011 M	71	14	254	77	13	113	6.7%	-6.00 [-8.95, -3.05]
Kollias 2009 M	74	8	164	75	7	115	7.5%	-1.00 [-2.77, 0.77]
Musso 2011 M	64	10	400	70	10	125	7.4%	-6.00 [-8.01, -3.99]
Subtotal (95% CI)			**4781**			**1005**	**43.9%**	**-3.45 [-6.57, -0.34]**
Heterogeneity: Tau² = 14.04; Chi² = 100.88, df = 5 (P < 0.00001); I² = 95%								
Test for overall effect: Z = 2.17 (P = 0.03)								
Female participants								
Burke 2004 F	67	6	522	64	7	78	7.6%	3.00 [1.36, 4.64]
Chiolero 2006 F	67	8	3198	73	9	812	8.0%	-6.00 [-6.68, -5.32]
Cobayashi 2010 F	63	8	80	71	10	96	6.9%	-8.00 [-10.66, -5.34]
Duncan 2011 F	74	14	198	76	16	57	5.3%	-2.00 [-6.59, 2.59]
Kollias 2009 F	73	6	207	75	7	72	7.5%	-2.00 [-3.81, -0.19]
Musso 2011 F	63	9	360	69	9	78	7.2%	-6.00 [-8.20, -3.80]
Subtotal (95% CI)			**4565**			**1193**	**42.5%**	**-3.51 [-6.96, -0.06]**
Heterogeneity: Tau² = 17.03; Chi² = 116.18, df = 5 (P < 0.00001); I² = 96%								
Test for overall effect: Z = 1.99 (P = 0.05)								
Male and female combined								
Klein-Platat 2005	65	11	60	67	10	60	6.0%	-2.00 [-5.76, 1.76]
Lurbe 2006	58	8	180	61	8	165	7.6%	-3.00 [-4.69, -1.31]
Subtotal (95% CI)			**240**			**225**	**13.6%**	**-2.83 [-4.37, -1.29]**
Heterogeneity: Tau² = 0.00; Chi² = 0.23, df = 1 (P = 0.63); I² = 0%								
Test for overall effect: Z = 3.60 (P = 0.0003)								
Total (95% CI)			**9586**			**2423**	**100.0%**	**-3.35 [-5.17, -1.53]**
Heterogeneity: Tau² = 10.63; Chi² = 223.15, df = 13 (P < 0.00001); I² = 94%								
Test for overall effect: Z = 3.61 (P = 0.0003)								
Test for subgroup differences: Chi² = 0.21, df = 2 (P = 0.90), I² = 0%								

Mean Difference IV, Random, 95% CI

-10 -5 0 5 10

Lower in UW/NW group Lower in OW/Ob group

(c)

total cholesterol (in mmol)

Study or Subgroup	Not overweight (UW/NW) Mean	SD	Total	Overweight/Obese (OW/Ob) Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Male participants								
Cobayashi 2010 M	4.02	0.66	67	4.16	0.82	75	13.3%	-0.14 [-0.38, 0.10]
Jung 2010 M	4.01	0.8	42	4.08	0.75	35	6.7%	-0.07 [-0.42, 0.28]
Musso 2011 M	3.79	0.62	399	3.82	0.76	126	34.7%	-0.03 [-0.18, 0.12]
Subtotal (95% CI)			508			236	54.7%	-0.06 [-0.18, 0.06]
Heterogeneity: Tau² = 0.00; Chi² = 0.58, df = 2 (P = 0.75); I² = 0%								
Test for overall effect: Z = 1.00 (P = 0.32)								
Female participants								
Cobayashi 2010 F	4.25	0.77	83	4.14	0.76	96	15.5%	0.11 [-0.11, 0.33]
Musso 2011 F	3.99	0.8	360	3.88	0.61	78	29.9%	0.11 [-0.05, 0.27]
Subtotal (95% CI)			443			174	45.3%	0.11 [-0.02, 0.24]
Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 1.00); I² = 0%								
Test for overall effect: Z = 1.66 (P = 0.10)								
Total (95% CI)			951			410	100.0%	0.02 [-0.07, 0.11]
Heterogeneity: Tau² = 0.00; Chi² = 4.21, df = 4 (P = 0.38); I² = 5%								
Test for overall effect: Z = 0.35 (P = 0.72)								
Test for subgroup differences: Chi² = 3.63, df = 1 (P = 0.06), I² = 72.5%								

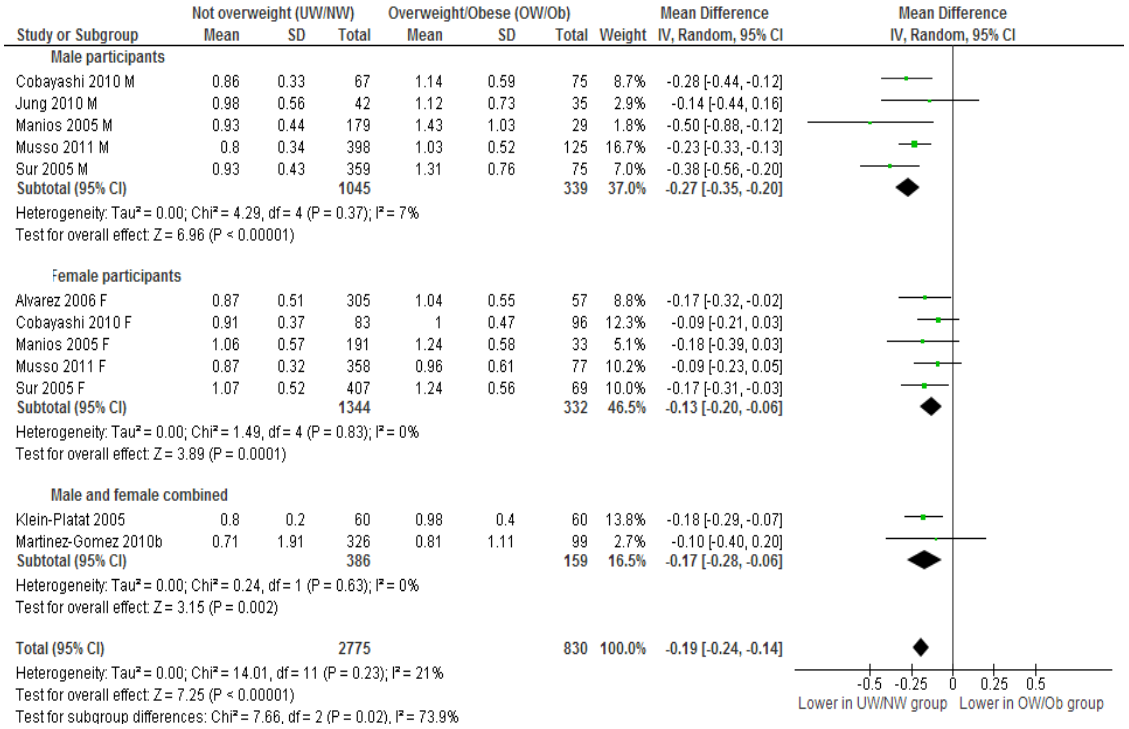
Mean Difference IV, Random, 95% CI

-0.2 -0.1 0 0.1 0.2

Lower in UW/NW group Lower in OW/Ob group

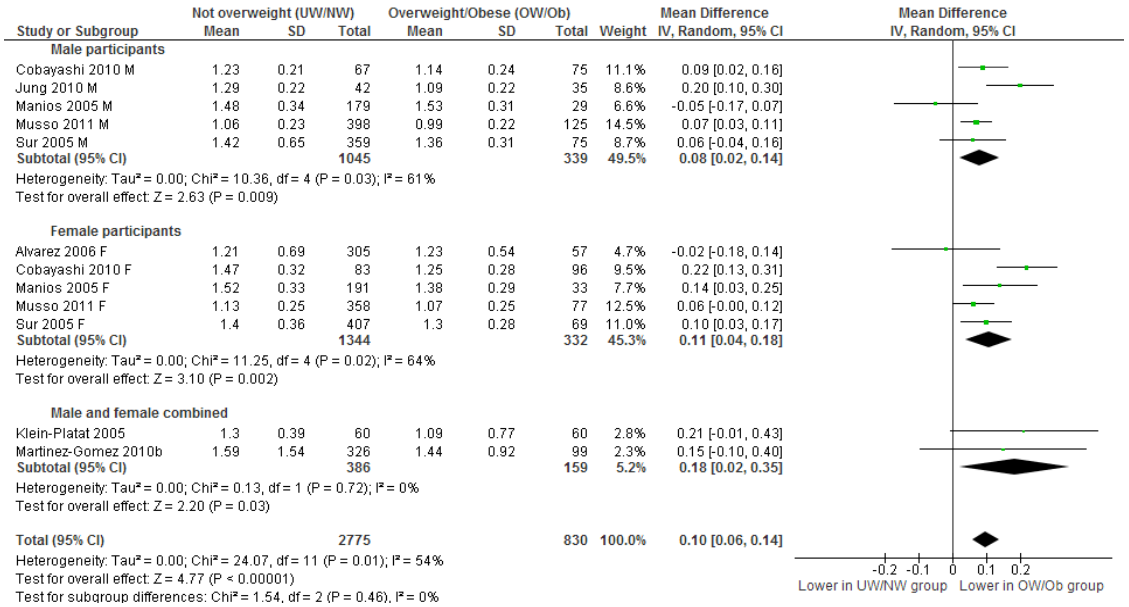
(d)

triglyceride concentation (in mmol)



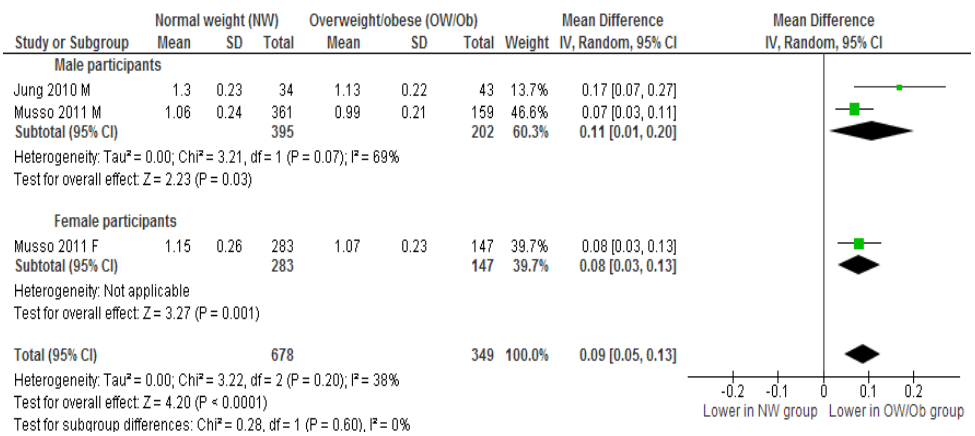
(e)

HDL concentration (in mmol)



(f)

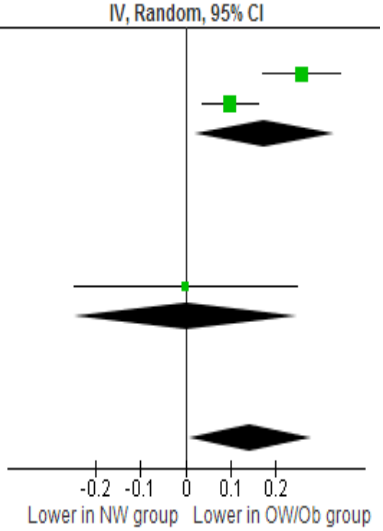
HDL concentration (in mmol)
Comparison using waist circumference



(g)

HDL concentration (in mmol)
Comparison using waist to height ratio

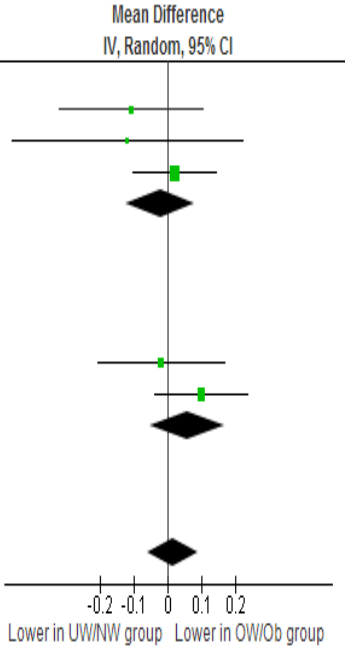
Study or Subgroup	<0.5 (NW) Mean	SD	Total	≥0.5 (OW/Ob) Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Male participants								
Jung 2010 M	1.3	0.22	47	1.04	0.17	30	39.2%	0.26 [0.17, 0.35]
Musso 2011 M	1.05	0.23	488	0.95	0.18	35	42.5%	0.10 [0.04, 0.16]
Subtotal (95% CI)			535			65	81.7%	**0.18 [0.02, 0.33]**
Heterogeneity: Tau² = 0.01; Chi² = 8.46, df = 1 (P = 0.004); I² = 88%								
Test for overall effect: Z = 2.21 (P = 0.03)								
Female participants								
Musso 2011 F	1.12	0.25	423	1.12	0.44	12	18.3%	0.00 [-0.25, 0.25]
Subtotal (95% CI)			423			12	18.3%	**0.00 [-0.25, 0.25]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.00 (P = 1.00)								
Total (95% CI)			958			77	100.0%	**0.14 [0.01, 0.28]**
Heterogeneity: Tau² = 0.01; Chi² = 9.87, df = 2 (P = 0.007); I² = 80%								
Test for overall effect: Z = 2.07 (P = 0.04)								
Test for subgroup differences: Chi² = 1.38, df = 1 (P = 0.24), I² = 27.6%								



(h)

LDL concentration (in mmol)

Study or Subgroup	Not overweight (UW/NW) Mean	SD	Total	Overweight/Obese (OW/Ob) Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Male participants								
Cobayashi 2010 M	2.4	0.59	67	2.51	0.71	75	12.5%	-0.11 [-0.32, 0.10]
Jung 2010 M	2.44	0.83	42	2.56	0.7	35	4.9%	-0.12 [-0.46, 0.22]
Musso 2011 M	2.37	0.53	398	2.35	0.65	125	36.6%	0.02 [-0.11, 0.15]
Subtotal (95% CI)			507			235	54.0%	**-0.02 [-0.13, 0.08]**
Heterogeneity: Tau² = 0.00; Chi² = 1.40, df = 2 (P = 0.50); I² = 0%								
Test for overall effect: Z = 0.44 (P = 0.66)								
Female participants								
Cobayashi 2010 F	2.41	0.66	83	2.43	0.62	96	16.2%	-0.02 [-0.21, 0.17]
Musso 2011 F	2.46	0.7	358	2.36	0.53	77	29.8%	0.10 [-0.04, 0.24]
Subtotal (95% CI)			441			173	46.0%	**0.06 [-0.05, 0.17]**
Heterogeneity: Tau² = 0.00; Chi² = 1.01, df = 1 (P = 0.32); I² = 1%								
Test for overall effect: Z = 1.01 (P = 0.31)								
Total (95% CI)			948			408	100.0%	**0.01 [-0.06, 0.09]**
Heterogeneity: Tau² = 0.00; Chi² = 3.49, df = 4 (P = 0.48); I² = 0%								
Test for overall effect: Z = 0.37 (P = 0.71)								
Test for subgroup differences: Chi² = 1.07, df = 1 (P = 0.30), I² = 6.7%								



(i)

Insulin concentration (in pmol)

Study or Subgroup	Not overweight (UW/NW) Mean	SD	Total	Overweight/Obese (OW/Ob) Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Male participants								
Cobayashi 2010 M	46.68	20.42	65	99.53	67.23	74	15.3%	-52.85 [-68.95, -36.75]
Musso 2011 M	40.7	26.88	218	63.13	41.6	74	18.0%	-22.43 [-32.56, -12.30]
Subtotal (95% CI)			283			148	33.4%	**-36.97 [-66.75, -7.19]**
Heterogeneity: Tau² = 415.59; Chi² = 9.82, df = 1 (P = 0.002); I² = 90%								
Test for overall effect: Z = 2.43 (P = 0.01)								
Female participants								
Alvarez 2006 F	38.55	104.81	289	45.56	61.67	53	13.3%	-7.01 [-27.54, 13.52]
Cobayashi 2010 F	52.16	27.37	82	95.09	44.59	96	17.8%	-42.93 [-53.64, -32.22]
Musso 2011 F	49.94	35.07	311	63.55	35.9	64	18.2%	-13.61 [-23.23, -3.99]
Subtotal (95% CI)			682			213	49.3%	**-22.02 [-44.58, 0.55]**
Heterogeneity: Tau² = 346.56; Chi² = 19.09, df = 2 (P < 0.0001); I² = 90%								
Test for overall effect: Z = 1.91 (P = 0.06)								
Male and female combined								
Klein-Platat 2005	46.5	29.4	60	82.2	36.4	60	17.3%	-35.70 [-47.54, -23.86]
Subtotal (95% CI)			60			60	17.3%	**-35.70 [-47.54, -23.86]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 5.91 (P < 0.00001)								
Total (95% CI)			1025			421	100.0%	**-29.38 [-42.06, -16.71]**
Heterogeneity: Tau² = 205.22; Chi² = 31.97, df = 5 (P < 0.00001); I² = 84%								
Test for overall effect: Z = 4.54 (P < 0.00001)								
Test for subgroup differences: Chi² = 1.18, df = 2 (P = 0.56), I² = 0%